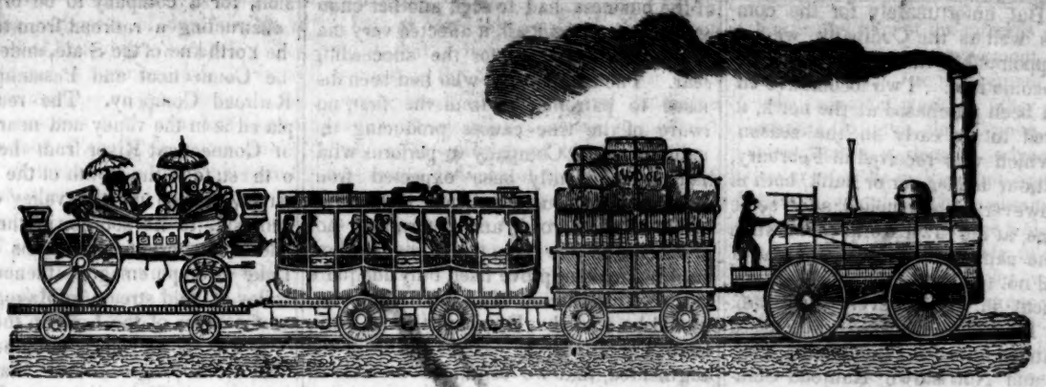

AMERICAN RAILROAD JOURNAL;

AND ADVOCATE OF INTERNAL IMPROVEMENTS.

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D. K MINOR, and GEORGE C. SCHAEFFER, } EDITORS AND PRORIETORS.] SATURDAY, NOVEMBER 26, 1836. [VOLUME V.—No. 47.

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, NOVEMBER 26, 1836.

AN ELEGANT STEAM ENGINE AND BOILERS, FOR SALE.

THE Steam Engine and Boilers, belonging to the STEAMBOAT HELEN, and now in the Novelty yard, N Y. Consisting of one Horizontal high pressure Engine, (but may be made to condense with little additional expense) 36 inches diameter, 10 feet stroke, with latest improved Piston Valves, and Metalic packing throughout.

Also, four Tubular Boilers, constructed on the English Locomotive plan, containing a fire surface of over 600 feet in each, or 2500 feet in all—will be sold cheap All communications addressed (post paid) to the subscriber, will meet with due attention.

HENRY BURDEN.

Troy Iron Works, Nov. 15, 1836. 47—tf

A SPLENDID OPPORTUNITY TO MAKE A FORTUNE.

THE Subscriber having obtained Letters Patent, from the Government of France, granting him the exclusive privilege of manufacturing Horse Shoes, by his newly invented machines, now offers the same for sale on terms which cannot fail to make an independent fortune to any enterprising gentlemen wishing to embark in the same.

The machines are in constant operation at the Troy Iron and Nail Factory, and all that is necessary to satisfy the most incredulous, that it is the most VALUABLE PATENT, ever obtained, either in this or any other country, is to witness the operation which is open for inspection to all during working hours. All letters addressed to the subscriber (post paid) will receive due attention

Troy Iron Works, HENRY BURDEN.

N. B. Horse Shoes of all sizes will be kept constantly for sale by the principal Iron and Hard-ware Merchants, in the United States, at a small advance above the price of Horse Shoe Iron in Bar. All persons selling the same, are AUTHORISED TO WARRANT EVERY SHOE, made from the BEST REFINED IRON, and any failing to render THE MOST PERFECT SATISFACTION, both as regards workmanship and quality of Iron, will be received back, and the price of the same refunded.

H. BURDEN.

47—tf

RAILROAD TREASURER'S OFFICE.
TUSCUMBIA, Aug. 1, 1836.

TO THE PRESIDENT AND DIRECTORS OF THE TUSCUMBIA, COURTLAND AND DECATUR RAILROAD COMPANY.

GENTLEMEN:—The following Report will exhibit the situation of this department and the transactions that have transpired from the time of my appointment [11th of April, 1836] to this day.

In pursuance of resolutions of your Board, exertions have been continually making to get the old balances on stock liquidated; for this purpose, I obtained the services in part, of Mr. Walter Simpson, who proceeded upon that business, under written instructions, [a copy of which is appended to this report, marked No. 1.] He visited nearly every stockholder, who was accessible at the time; and succeeded in closing many of the accounts; but still a long list, amounting to a large sum of money, is standing open, which from one cause or other, could not, up to this date, be brought to a close. This business will continue to occupy my attention until all these accounts are closed. A list of stockholders is appended, marked No. 2, exhibiting the number of shares held by each individual, and the balance due from the same.

From this list, it also appears that the total original stock amounts to 3,063 shares, equal $306,300. Of which 258 shares have been transferred to the Company.

Of the 1,500 shares of the additional stock created in June last, 1,155 shares have been subscribed, and secured [excepting $7,500] in the way proposed by the resolution of your Board. 345 shares remain to be subscribed: when this shall have been done, the total capital stock in the Company will amount to 4,563 shares, equal $456,300.

An account current, showing the receipts and disbursements in this department is annexed, marked No. 3, by which it appears that the receipts from various sources have amounted to $207,396 76 cts. and the disbursements to date, amount to $164,216 23, leaving a balance of cash in the Treasury on this day, of $43,180 50.

A general list of balances is also annexed as drawn from the books of this department. All of which is very respectfully submitted.

DAVID DESHLER, *Treasurer of the Tuscumbia, Courtland and Decatur Railroad Company.*

ENGINEER AND GENERAL SUPERINTENDENTS OFFICE.
TUSCUMBIA, Aug. 1, 1836.

TO THE PRESIDENT AND DIRECTORS OF THE TUSCUMBIA, COURTLAND AND DECATUR RAILROAD COMPANY.

GENTLEMEN:—In compliance with the regulations of the Company, I beg leave to submit the following brief Report, showing the operations in this department, from the period of the last annual Report from the Engineer department, 4th March 1834. At the date of that report, the Railroad had been completed to Town Creek, say 14¾ miles above Tuscumbia, and was in rapid progress of construction, for the remaining 8 miles to Courtland. The space between Courtland and Decatur had just been let to contract, and the contractors were beginning upon the work. By 4th July the road was completed, and opened as far as Courtland. And on the 15th December of the same year, [1834] the work was accomplished to the town of Decatur, and the locomotive with her train of cars, passed through the whole extent of the road for the first time. Thus it will be seen that 28¼ miles of the road were accomplished in a little over nine months.

Before the road was quite completed business began to accumulate. In anticipation of that event large quantities of merchandize, destined for the upper Tennessee, had been sent to Courtland, to remain until a thorough transit should be af-

forded. But unfortunately for the community as well as the Company, we had been disappointed in the receipt of cars as well as locomotives. Two locomotive engines had been purchased at the north, to be delivered to us early in the season. One of which was received in February, 1835, without tender car or tank, both of which however were supplied, after some loss of time, at our own works; but when the engine came to be put on the road it was found not to answer the purpose, being deficient in almost every important respect. This engine had been purchased second handed from the Philadelphia, Germantown and Norristown Railroad Company—an article which they had tried to their own satisfaction, and were no doubt, pleased at the opportunity of disposing of it. The other engine did not arrive until about the 1st of January—this engine was made at the West Point Foundery, New-York, and had the appearance of a good article, and indeed performed well for a few weeks—but owing to a defect in the castings of the cylinders, as well as a bad arrangement in the slides that carry the crossheads, one of the cylinders gave way on the 15th day of June, immediately under the exhaust passage, bursting open nearly its whole length; the metal in that part being only about an eighth of an inch in thickness. The engine of course was perfectly useless until new cylinders could be procured. Not being prepared with tools at our own works to remedy the difficulty. I wrote to Mr. Kemble, the manager of the West Point Foundry, advising him of the deficiency of the engine, and requesting that he would, with all practicable despatch, make a new pair of cylinders, as well as slides, and forward them to us. Which he promised to do. We waited on his promise till quite late in the fall, say October or November, expecting daily to hear of the anxiously looked for articles; till at last despairing of any further news from the West Point Foundry, we set to work at our own shops and accomplished the job, so that said engine has been in service since some time in January last, and answers a good purpose. From the West Point Foundry we have not even to this day heard a word of excuse or apology for the treatment given us.

Our car establishment was also extremely limited at the period of opening the road, amounting to but about 15 lumber and 3 pleasure cars, instead of from 50 to 75, the number required.

Owing to these various disappointment in regard to motive power, we were compelled to resort to the only alternative left us, horses to do the business. And in the use of this kind of power, the want of car was much more sensibly felt than it would have been with engines, owing to the limited speed of horses; besides this the railroad having been just completed as the winter and bad weather set in, and the horse path not being gravelled, the path very soon became almost impassable for horses. In consequence, it was entirely beyond our means to perform the transportation that was offered to us during the winter of 1834 and '35, and a large portion of the business had to seek another channel. This was not all, it affected very materially our business for the succeeding year. The community who had been disposed to patronise us from the first, no aware of the true causes producing the inability of the Company to perform what had so confidently been expected from them, became soured in their feelings towards the Railroad, and determined not to encourage the Company any further, until it should be prove itself fully adequate to the transportation of all the freights that should be offered. By about the 1st July, 1835, the number of cars had been so far augmented, that we began to be able to keep up with the business; every exertion was continued to be made to increase the number of cars, and at the same time two new locomotive engines were ordered, one from M. W. Baldwin, of Philadelphia, and the other from Liverpool. The former was placed upon the road about the 1st of June last, but the latter has not yet arrived, owing as we understand, to the great number of orders on hand before ours. It is however, a gratifying fact to state, that since about the 1st July, 1835, we have had the capacity to accomplish the business that was offered, although at an immense expense, owing to the mixture of motive power used upon the road. From the period last above mentioned, up to this date, I presume about one third to one half of the business was done by horses, and the remainder by locomotives, viz: one small engine, the "Fulton," the "Comet," since January last, and the "Triumph," since about the 1st of June. Since the latter engine was placed on the road, no horse power has been used in transportation between Tuscumbia and Decatur. I say we were able to do the business that was offered and I confidently believe we had the capacity to double the amount that was presented since October or November last, and our car establishment having been continually augmenting, we feel perfectly assured, that although the business the ensuing year is expected to be fully double what it was the last 12 months, yet we shall be enabled without difficulty to give it despatch.

From the Vermont Daily Journal.

REPORT OF THE COMMITTEE ON ROADS AND CANALS,

To the Hon. Senate and House of Representatives.

Your committee on Roads and Canals to whom was referred so much of the message of the Executive as relates to internal improvements, and also sundry memorials praying for an appropriation for surveys of routes with reference to the construction of railroads in the eastern, western and central parts of the State, respectfully report: That they have had the subject under consideration in joint committee, and ask leave to submit the following facts and opinions.

First. In relation to the contemplated route for a railroad on the East side of the Mountain, it appeared that a charter was granted by the Legislature at its last session, for a company to be organized for constructing a railroad from the south to the north line of the State, under the style of the Connecticut and Passumpsic Rivers Railroad Company. The route contemplated is in the valley and near the banks of Connecticut River from the south line of the state to the mouth of the Passumpsic River, thence up the valley of the Passumpsic, to its source, in the vicinity of one of the principal streams falling into Lake Memphremagog, thence down the valley of said stream to Magog Lake, and on the shore of the Lake to the line.

It was shown your committee, that measures are in progress in the States of Connecticut and Massachusetts, for the construction of a railroad from Hartford Ct. to Brattleborough, meeting at the latter place, with the Connecticut and Passumpsic Rivers Railroad. That a sufficient amount of funds have been secured for defraying the expense of a survey, which survey is now in progress. From Hartford to New-Haven Connecticut, a railroad is already in progress of construction, and will probably be completed the ensuing season.

It was further shown before your committee that memorials are pending before the Provincial Parliament of Lower Canada, for Charters for railroads from the south line of the Province near Magog Lake, down the valley of the St. Francis to Port St. Francis, on the St. Lawrence river, and also from the south line of the Province aforesaid, to the outlet of the Lake, and thence to St. Johns, in the direction of Montreal—that the route in the valley of the St. Francis has already been surveyed from Port St. Francis, as far as Sherbrooke, and a favorable report made—and that it is expected this survey will be completed to the Province line the present season.

Your committee further learn that by the aid of report of surveys which have heretofore been made with reference to the construction of a canal up the Connecticut and Passumpsic rivers, data have been formed upon which estimates have been made as to the practicability and probable expense of constructing a railroad upon the above route, and that in the opinion of an eminent and experienced Engineer, Col. James Stevens of R. I. (as published in his report at a convention holden at Windsor,) the route is in a high degree feasible, and the facilities for constructing a railroad, with comparatively moderate expense, are greater than in almost any other section of the United States.

According to the estimates of the aforesaid gentleman, the expense of constructing a railroad on this route, upon the most permanent and approved plan, similar to the Boston and Providence railroad, exclusive of grading, will be $8,000 a mile for a single track, including the turn outs; and that the grading on an average will not exceed $5,000 a mile for a double track including masonry, bridges, engineering and all contingent expenses—and that the superstructure of a road with timber, without rubble stone, might cost $6,000 a mile

less than the estimates of one similar to the Boston and Providence railroad. This route is adapted to accommodate the whole of the eastern slope of the mountain, including the counties of Orleans and Essex; and the amount of available water power, distributed almost equally through its whole extent, is shown to exceed that of any other section of equal extent in the United States, and probably of any other country known. This route will intersect at Springfield, Mass. the "Western railroad," leading from Boston to Albany. It also intersects the contemplated route for a railroad from Lowell and Concord, N. H. to Burlington, Vermont, through the valleys of White and Onion Rivers.

In relation to the contemplated route on the west side of the mountain, your committee are informed that there is now a McAdamized road from Bennington to Troy N. Y. graded and nearly completed. That the charters for said road permit the occupancy of it for a railroad, and that the grading has been made with reference to this object, as respects inclinations, curving, &c.

From Bennington, the route extends through the counties of Bennington, Rutland, Addison, Chittenden and Franklin to Canada line, in the direction of St. Johns and Montreal. It is believed that no obstacle will be found which may not be surmounted, in constructing a railroad on the above route. The whole section through which it would pass, is rich in the production of Iron, Marble, and in many parts Copperas, Manganese, Ochre and various other productions of first importance in the arts and manufacturing operations of the country—while through its whole extent is found an abundant water power, rendering it a most desirable location for the manufacturer.

Your Committee cannot doubt that the construction of these contemplated railroads, or any considerable portion of them, if found practicable, would result greatly to the advantage of the various interests of the citizens of Vermont. It would facilitate commerce, opening any obstructed and expeditious intercourse with different Atlantic cities. It would encourage Manufactures, and bring into requisition a vast amount of water power now unoccupied. It would add to the wealth of the State, by inviting investments of capital from the wealthy towns and cities on the sea board. It would increase the value of real estate, not only in the vicinity of the routes, but throughout the whole extent of the State. It would increase the population of the State, which is already becoming sparse in many parts through the blighting influence of the spirit of emigration. But the greatest advantages to be derived from a work of this kind would be in favor of the *agricultural* interest. Indeed important as these improvements would prove to the various commercial, manufacturing and mechanical operations of the State in the opinion of your committee, these and all other interests combined would not derive so great an amount of benefits from them as the farming interest alone.

It is at once apparent, and a point conceded, that if Railroads were to be constructed on the line of the principal route contemplated, extensive and numerous manufacturing villages would immediately grow up in every good location within a reasonable distance of these roads. This opinion rests not merely upon theory, but upon the fact that such results have invariably followed the construction of Canals and Railroads in every other section of the interior of the country. The consequence in Vermont would be the creation of a market almost at the door of every farmer, not only for all the staple products of his farm, but for various articles, as vegetables, timber, stone, &c. &c. which now are accounted as comparatively of very little value.

The staple products of Vermont, as wool, butter, cheese, pork, &c. are principally transported in various methods to New-York, Boston and other maritime markets, at an expense averaging from fifteen to twenty dollars a ton. This item of freight is a dead loss to the producer, for the mere transporting of an article from one place to another adds nothing to its real value. A pound of butter sent from Vermont to Boston is a pound of butter still. A ton of pork sent from Vermont to Boston is no more than a ton of pork still, and will go no further with the consumer than if it had not been subjected to this process of transportation.

Now if by the construction of Railroad, the consumer is induced to locate in the immediate vicinity of the producer, it is obvious that the item of freight will be to a very considerable extent dispensed with.

Your committee have not had access to such statistical accounts as would be necessary to enable them accurately to estimate the various agricultural productions of Vermont, but assuming that the staple articles which are now subjected to the expense of transportation, amount in the aggregate to ten thousand tons,—an estimate which it is believed is below the facts,—it will be seen that at twenty dollars a ton there is now a dead loss to the producer of these articles, upon the above assumption, of two hundred thousand dollars in the simple item of transportation. In other words, if the proposed improvements were to be completed there would result therefrom a net saving to the farmers of Vermont, in the item of transportation alone, of two hundred thousand dollars annually. And if it be said that any deductions should be made from the above estimates, on the ground that a considerable portion of the agricultural products of the State would still find a market on the sea board, although at a diminished expense for freight, it is still believed that such deduction would be more than supplied from the market of such articles as will not now pay the cost of transportation, to say nothing of the great advantages to the producer resulting from the competition in prices which would arise from a multiplication of market towns.

Your committee have taken into consideration the apparent *necessity* of some action on the part of the citizens of Vermont in aid of internal improvement, in view of the fact that the encouragement afforded to these important works in other States has operated to give the various interest of those States a decided advantage over similar interests in Vermont—an advantage which they could not have obtained but for these works—an advantage which will continue to operate disastrously to the people of this State, unless similar works of internal improvement are prosecuted here. The unprecedented spirit of emigration which has during the last twelve months taken from Vermont thousands of her most industrious and valuable citizens, and which threatens a further drain upon her comparatively limited population, is not produced wholly by the fact that western lands are cheap and productive; but mainly from the fact that these are directly accessible by means of railroads and canals. The Legislatures of the Western States have been aware of the importance of these public works. Hence the fact that Ohio and Indiana, and Illinois, and Michigan, even, are engaged in the construction of Railroads and Canals, not merely from one important point to another, but frequently from the principal forwarding depots into the interior. The people know and enjoy the benefits of these works, and they enjoy them at an expense to the State of Vermont, of many of her most valuable sons, from whom she withholds that encouragement which is offered them by other States through these public works.

But it is believed little need be said to demonstrate to this legislature and to the citizens of this State generally, that the projected improvements are important and worthy of patronage, *if practicable*. It becomes therefore important to inquire, preliminary to any action, is the enterprise practicable? If these railroads are chartered, surveyed and the stock created, will such stock be taken up? Will the probable amount of business be such as to convince capitalists that such stock will prove a profitable investment?

Of the practicability of constructing railroads on these routes, your committee believe they have information, which will enable them to express an affirmative opinion, both in view of the physical obstructions on the routes, and the facilities for bringing the expense of these roads within such limits as shall ensure a fair profit upon the investment,

Your committee have called the attention of the House to the report of an experienced engineer, based upon certain surveys which were heretofore made from Hartford, Connecticut, to Canada line, with reference to the construction of a canal. Upon the practicability of constructing a railroad upon this route, this gentleman remarks that "so far as rise and fall are to be regarded, no unusual obstacle is presented; that for so great an extent the route is uncommonly level, and that there is no one point of obstruction in the whole extent that may not be readily overcome, and that without serious expense." The same is

probably true of the other routes to a considerable extent.

Similar surveys upon the central railroad route, show the rise from Lake Champlain to Montpelier, to be about 400 feet, and thence to the height of land in the valley leading to White River, about 350 feet more, making an elevation above Lake Champlain of about 750 feet.

Upon the route on the west side of the mountain, no surveys are known to have been made, but from information obtained from gentleman well acquainted with the geography of the country, your committee are induced to believe that a railroad may be constructed from Bennington through Manchester, Rutland and Middlebury to the north line of the state, following the valleys of the Battenkill and Otter Creek, and probably approaching the shores of the lake in Chittenden and Franklin counties, and that the facilities are equal to those of the route on the east side of the mountain.

While many of the most important railroads in the U. States have been constructed with reference to the greaest permanency, at an expense far beyond any means which can be commanded for similar works in Vermont, it is also ascertained that other railroads are now in operation on important routes, in the construction of which great economy has been observed, and which are found practically to answer all the purposes of those more substantially built. While the Schenectada and Utica Railroad was built at an expense of $21,000 a mile, the Saratoga railroad exclusive of the bridges over the *Sprouts* of the Mohawk, cost but $6,500 a mile. And in the estimate of Col. Stevens, above mentioned, while the cost of a railroad in the valley of the Connecticut will amount to $13,000 a mile upon the plan of the Boston and Providence railroad, a plan equally practicable might be adopted at a saving in expense of $6,000 a mile—making the entire cost of the superstructure of a road on this route only $7,000 a mile.

Corroborative of the correctness of this estimate may be mentioned the opinion of the Engineer, now engaged in making estimates upon the New-York and Erie railroad, formed the present season, while passing through the valley of the Connecticut river from the white Hills to Hartford, Connecticut.

Of the amount of business which these railroads if constructed would command, your committee would only remark, that no proper estimate can now be made in view of the present business operations of the State. The immense increase of business and of transit on those routes in other states now enjoying the benefits of railroads has uniformly exceded the fondest anticipations of the friends of those works while it has astonished those who had stood aloof from the enterprise. And this remark is true not only in its application to the principal thorough fares of the country, but to every considerable railroad in the interior of the United States.

Should the entire works now proposed be ever completed, connecting the cities of the St. Lawrence with those of the Atlantic, it is obvious to remark that the freight for passengers, travelling for business and pleasure from the *termini* of the routes alone would approximate to an amount equal to the interest of the investment.

With these views your committee venture the opinion that if measures are adopted for procuring competent surveys under the superintendence of Engineers known to the public, and if corporations should be organized for the construction of railroads upon the routes in question, the stock of such corporations to a very considerable extent will be taken, and the work commenced with a reasonable prospect of ultimate completion.

In expressing this opinion your committee do not rely mainly upon their own opinion or knowledge of facts, but have paid great deference to the opinions of gentlemen actively engaged in the prosecution of similar works in other states, whose observation and knowledge of facts enabled them to form conclusion from existing circumstances upon which great reliance may be placed. In reply to an inquiry addressed to James Brewster, Esq. President of the New-Haven and Hartford Railroad Company, that gentleman writes, "As to the question whether the stock will be taken, I think there cannot be a doubt, first because I think it will promise ample returns, and secondly it will secure a decided influence in its favor in the city of New-York. I feel a confidence that were a subscription for the stock opened in New-York and other places at a proper time with reference to the money market, it would be filled immediately."

But however correct may be the opinions of individuals on this subject, it is most obvious that capitalists from abroad can never be induced to furnish the means for preliminary surveys. Nor will it be possible to call their attention to the importance of this, or any other similar enterprize, until competent surveys shall have been made, with approximate estimates. Then and not till then, can they be induced to examine into the importance of the work with reference to the value of the stock.

In view of the foregoing premises, your committee recommend that an appropriation be made by this Legislature of

dollars, out of any funds in the Treasury not otherwise appropriated, in aid of preliminary surveys of the principal and most important routes, with reference to the construction of railroads thereon, and that your committee be further instructed to report a bill accordingly.

E. FAIRBANKS, *Chairman of Committee from House.*

A. YOUNG, *Chairman of Committee from Senate.*

STEAM-ENGINES.—There are in Glasgow and its suburbs 310 steam-engines, viz. 176 employed in manufactories; 59 in collieries; 7 in stone-quarries; and 68 in steam-boats. Average power of engines, 20.46.100th; total horses' power, 6406.

We take great pleasure in publishing the following report, containing a very complimentary notice of Thomas Blanchard, one of the greatest mechanics of the day. In our notice of the Fair of the American Institute we shall mention some of the most usefuf inventions of Mr. B., which elicited universal admiration.

From the Journal of the American Institute.

REPORT ON THE NAVIGATION OF THE UPPER ROANOKE, BY MEANS OF STEAMBOATS OF SHALLOW DRAUGHT.

LAWRENCEVILLE, June 20th, 1836.

TO COL. ANDREW JOYNER, Superintendant of the Roanoke Navigation Company.

Sir: Agreeably to the order of the board of directors, made at their meeting in April last, I set out, on the 12th day of last month, to perform the duty assigned me. The people of Clarkesville most promptly and liberally responded th this effort of ours, by appointing Tucker Carrington, Esq., to accompany me, from whom I received much assistance.

From the Hon. Walter Coles, and the Hon. B. W. Leigh, we obtained every assistance they could give us in our investigations, by procuring and giving us letters to all persons in our route most capable of aiding us in obtaining the information we were seeking. These letters enabled us to make the acquaintance of many persons in the city of New-York, and the States of Connecticut and Massachusetts, best acquainted with the subject of steam navigation in shoal water. In T. B. Wakeman, Esq., of the American Institute of New-York, Alfred Smith, Esq., of Hartford, Con., and Charles Stearns, Esq., of Springfield, Mass., I found gentlemen well acquainted with the subject, and who were not only willing, but did put themselves to much trouble and inconvenience to oblige and assist us in every thing we desired. And although we applied to no one who did not manifest the greatest willingness to assist us, yet I should be doing injustice to myself and to one of the most valuable and worthy men in New-England, did I not in a most especial manner acknowledge the great kindness and service rendered us by Alfred Smith, Esq. Mr. S., like all his countrymen, is engaged in business, to which he devotes himself with great assiduity; and his worth being duly appreciated by his fellow townsmen, much of the public business is thrown on his hands. Notwithstanding all this—and although at the time of our visit to Hartford, he was superintending the erection of a large public building—he gave us many hours of his time every day, during our sojourn in that city. He had been superintendant of all the improvements on the Connecticut river, and knew all the facts in relation to them. He gave me a duplicate of the profile of the canals and locks around the falls; and a survey of the river, made under his direction; which I will send you for the use of the Roanoke Company by the first opportunity.

Every person to whom we mentioned the object of our visit to the north and east, invariably directed us to Thomas Blanchard, as the man to be consulted and employed by us. Indeed the unanimity with which all recommended Mr. Blanchard was astonishing—but when we went to Hartford and Springfield, and saw the steamer Massachusetts ascending the Enfield falls, and what he had done in the

United States' Armory at Springfield, we too, had no doubt of Mr. B.'s ability to put steamboats on the Roanoke, if mortal man could.

This extraordinary man was a common artisan in the United States' Armory at Springfield, and I was told by Col. Robb, the superintendant, that he had added improvement to improvement in the machinery there, until it would seem to be as perfect as the art and wit of man could make it—the principal of which, however, is the machine for *turning* gun stocks, and any irregular figure. But the improvement for which, perhaps, his country will be most indebted to him, is his steamboat for shoal water—it might be more appropriate to call it an invention—for it is built on a new principle. This gentleman I lost no time in engaging for our service; provided you should sanction it. By promptly adding your request to mine, you will soon have an opportunity of learning from Mr. B. himself, what he has done, and what he can do on our river.

I shall now proceed to mention such facts as I have collected, and I shall also venture to give you some conclusions I have drawn from those facts. Being, however, entirely ignorant of engineering, (never having had my attention directed to such pursuits,) my conclusions must be received with great allowance.

The better to appreciate and apply the facts to be detailed, some account of the Roanoke, Dan and Staunton rivers, will be necessary. The facts here stated of those rivers, are extracted from the surveys, &c. of Messrs. Moore, reported after the death of the principal engineer, by Mr. Isaac Briggs, to the Board of Public Works. The distance from Rock Landing to Clarkesville, is 60 miles—from Clarkesville to the highest point of the survey up Dan, is 125 miles—and from Clarkesville to the highest point of the survey up Staunton, is 109 miles. The whole fall from Rock Landing to Clarkesville, is 156.60 feet—average fall, per mile, 2.61 feet. Whole fall from Clarkesville of the 125 miles surveyed of the Dan river, is 277.47 feet—average fall per mile, 2.221 feet—whole fall of Staunton, from, Clarkesville in the 169 miles surveyed, is 322 621 feet—average fall per mile, 2 96. It will, from this be seen, that the navigation of the Staunton is the most difficult—and that of the Dan the best of the three rivers.

In one material thing these surveys are very deficient; namely, the fall throughout each mile; for although a fall of ten feet to the mile, might be easily overcome if equally distributed the whole distance, yet, as is frequently the case, if the whole fall, or a large portion of it, occurs at one or two places in the mile, it might defy all the power of man or steam. In other instances too, the survey only gives the fall for quarter, three, four and five miles; and free-distance from place to place, so that the discurs not be accurately known. This Staunton i frequently on the Dan and in the mile is; on the Roanoke, the fall in the Roano generally stated. The falls noticed are Eat[illegible], which require to be here feet—Ha[illegible]lin's Sh[illegible]ls, fall in the mile 11,1 16 11 feet. The nex[illegible]ls, fall in two miles (having no [illegible]ne to de[illegible]gnate it,) fall, 5.98 Horse-ford fall[illegible]ls, fall[illegible]n the mile 5.62. and Butcher's Cre[illegible]two [illegible]les 8.95 feet—fall in one mile 5.6[illegible]being two miles long. On the Dan the onl[illegible]d in [illegible]e other 5.50 are those of Hyco—th[illegible]es I shall notice, [illegible]ing [illegible]e only obstruction for some 50 or 60 miles above Clarkesville. These falls are about 1¾ miles long, fall 12.89 feet. On the Staunton, Fally's falls are the only obstacle to Brookneal—and it is useless to notice any other on that river. Here, the survey is too inaccurate to enable me to ascertain the distance to which is affixed the fall mentioned; but as well as I can understand it, the rapids must be about 1¾ miles—in which distance, the whole fall is 15.23.

I will now beg leave to conduct you to the Connecticut river, and lay before you some minute statistics. From Hartford (below which, the river is free from any obstruction) to the foot of Enfield falls is 12 miles—fall, not more than two or three inches to the mile, and the water smooth. Enfield falls are nearly 5 miles from head to foot; with 1 mile of slack water between the upper and lower falls, The lower falls extend nearly 2½ miles, (half a mile of which is slack water,) and has 20 feet descent—principally, if not entirely, confined to two miles; within these two miles there are a succession of rapids—one or two of them greater than the others. After the termination of the lower falls, one mile of slack water intervenes; after which, we come to the upper falls, being 1 mile in length, and having a descent of 10 feet—the descent is unequally distributed, being most of it in three bars, namely—at Enfield bridge, Mad Tom bar, and Surf bar. From the head of the falls to Springfield, is 8 or 9 miles—and from thence to the foot of Hadley falls, is about 8 miles farther; making the distance of 16 or 17 miles from one fall to the other—in all which distance there is slack water, and fall of only a few inches to the mile. One mile below Hadley falls, however, you have Williamansett falls, being not quite such hard water as upper Enfield falls. Hadley falls have a descent of 50 feet in 2½ miles, around which there are locks and a canal through which all boats and rafts are obliged to pass. From the head of Hadley falls to Miller's falls is 35 miles, with sand and gravel bars—having, by actual admeasurement, only between 8 and 9 feet fall in the whole distance. Above Miller's falls there is more rapid water, where steamboats have been tried without much success—owing, it would seem, more to the want of employment, than to their inability to navigate the river.

But to return to Enfield falls (where we have actual experiments and well attested facts for our guide)—several boats were put on the river and abandoned before they got one to succeed. There are now two passage boats, and I believe two tow boats. The passage boats, are the Vermont and Massachusetts—the former, intended to run in low water, is 75 feet long—including wheel, 13 feet wide—draws 19 inches. The Massachusetts is 97½ feet long, including wheel, (which is in her stern,) 13½ feet wide—draws 22 inches of water when laden, and has two engines 17½ horse power each. Aboard of this boat I passed over Enfield falls three times. She can carry 75 passengers, has no accommodations for night or meals—but comfortable cabins for both ladies and gentlemen. In ascending the lower rapid 2½ miles, she cleared them handsomely and with ease in 42 minutes; and she went up the upper falls (being exactly one mile) in 23 minutes by my watch. Descending, little or no steam is used—ascending, the boat is quite obedient to the helm; but when the current is extra strong, poles are used to keep her steady—descending she is also steered by a tow oar. She makes a daily trip from Hartford to Springfield, 26 miles, and back—going up in 5 hours, and returning in 2¾ hours—has run with regularity and entire success, for four years; and is considered as good property as any in New-England. She, as well as the Vermont, was built by Thomas Blanchard. Her crew consists of 5 hands, including captain and pilot—her expenses are about $100 a month; and cost about $6000; but owing to the advance in labor and materials, it is probable that such a boat would now cost more.

Around Enfield falls, as well as the other falls on the river, there are locks and a canal, through which the freight and tow boats pass. Though the tow boats have gone up Enfield falls, it is found to be best to go through the canal. These two boats can carry 150 tons, at the rate of 2½ miles an hour, against the current of 1½ miles an hour; but experience prove, that towing less than that, is much better. The William Hall, one of the tow boats, has ascended a rapid of 9 feet in the mile, towing up 20 tons—her engine is 20 horse power, and she cost between four and five thousand dollars. At Hadley falls, after the frieght boats get through the canal, they are taken in tow by another tow boat, at the head of the falls, and carried up to Miller's falls.

Before steamboats were used on this river, above the falls, the trade was carried on by means of freight boats of 25 tons, with a sail, to be used when the wind was fair. When these boats ascended Enfield falls, they took in additional hands, so as to have one hand to the ton, when they were propelled by poles; and I was told that it was as hard labor as men could endure: it frequently consumed the whole day to get one of them over the falls, 5½ miles. Here, steam has succeeded, both as applied to passage and tow boats—and it would seem from this, that where a man can push a ton up a current, by means of a pole, steam can be employed with success, profit and regularity.

The Connecticut, upon an average, can only be used for navigation seven months in the year—it is ice bound for three months and a half, (last year much longer,) and the water is too low for one and a half months in the summer. I saw Mr. Goddard in Hartford, who is the proprietor of the steamboats on the Altamaha, Ocmulgee, and Ockonee rivers, who informed me that they were entirely successful. I was also informed by Mr. D. Copeland, of Hartford, that he had succeeded in putting a steamboat on the St. Lawrence, where the fall was much greater than at Enfield: but I was unable to get the particulars, in consequence of Mr. Copeland's being obliged to leave Hartford for New-York unexpectedly. Mr. C. is an engine maker of high reputation, and a man of high standing. Mr. Blanchard has also succeeded (though not to the same extent that he has on the Connecticut) in putting steamboats on the Kennebec, Genesee, and Susquehanna rivers: in the latter, he informed me that he had ascended some half a dozen mill dams. This boat, however, did not run long, and she has not been repaired, or replaced by another.

Here, perhaps, with strict propriety, my communication should close; but some opinions must necessarily have grown out of what I have seen and heard—and I hope I shall be pardoned for expressing a few of them. This, however, considering the position of things, may do little else than draw forth a denial of the facts stated, an

unfriendly criticisms on the conclusions and reasons which I shall g ve. The improvements made by the Roanoke Compa ny, have brought into existence so man rival schemes for monopolizing the trad of the upper country, that almost any opin ion which may be expressed, will be *charitably* ascribed to a wish, to promote one, or put down another. I have what to me is a considerable interest in the Roanoke Company; and I am entirely unconnected with any other of the various and conflicting interests on, or pertaining to the river. I have looked at this subject exclusively as a stockholder of the company—and every thing I have done, and what I shall say, will have no other end in view, but the advancement of its interest.

The most important conclusion I have come to, is, that steamboats can be put on the Roanoke and its two principal tributaries, with profit and success—whether they will be able to navigate the *whole* of the Roanoke, Dan and Staunton, remains to be tested by actual experiments; but that they can be successfully and profitably employed on a large part of all three rivers, and that too, without the company's incurring much expense in further improvements of the beds of the rivers, I have as little doubt as I can have of any thing not yet demonstrated. The facts above stated, I think, abundantly warrant this conclusion. There is but one fall on the Roanoke greater than that of Enfield; there is not one on Dan or Staunton, for a considerable distance up both streams so gr at. Why, then, (it may be asked,) may we not ascend our rapids as well as they do those on the Connecticut?

From the head of Pugh's falls, almost to Danville, there is no rapid equal to the falls of Enfield by several feet to the mile—there are but three which can be considered as opposing any real difficulty—namely, the Horseford, Butcher's creek, and the Hyco falls. The Horseford has 8.95 feet fall in two miles, Butcher's Creek has a fall of 5.62 feet in one mile, and 5.59 in the other, and Hyco has 12.89 feet in one mile and three quarters. The only fall on the Staunton below Brookneal, of any magnitude, is Tally's falls, where the descent in one mile and three quarters is 15.23 feet—making in all only four places to be overcome, to render the rivers accessible to steamboats for largely upwards of one hundred miles, on the Roanoke and Dan, and about fifty miles on the Staunton. If nothing else could be done but to rescue these portions of the rivers from the state of comparative uselessness in which they at present are, would it be nothing? It appears to me that these improvements (if indeed any are required to be made) can be done by the company in a short time, and with but little expense. I am sensible that the board of directors, at their last meeting, directed that the work should be commenced at Rock Landing: but I think the policy of beginning at the head of Pugh's falls, and bestowing the first labor on the Horseford, Butcher's Creek falls, Hyco falls, and Tally's falls, is so obvious, that you ought to do, what I am sure the board would do, had they now to decide the question again. Our policy is certainly, to apply our labor so as to open as much of the river as we can, in the shortest time, and with the least expense: in what other way can it be done?

Let us consider for a moment, that these four obstacles are removed, and steamboats can navigate the rivers above supposed there would be an immediate, easy, and expeditious communication between Danville and the Gaston railway, by running stages a short distance down the river, from Danville to the boat; and from the head of Pugh's falls (about seven miles) to Gaston. And there would be nothing to prevent another boat's running from Brookneal to the same place. I do not think it improbable, in such a state of things, that a toll of one dollar for each passenger, would give the company more revenue, than all the other tolls put together.

As to the falls between the head of Pugh's falls and Rock Landing, and those high up on the Dan and Staunton, they would be attended to, after these four places should be put in order. I think it not improbable that the 12 miles below Pugh's falls, will require more labor and expense than all the others; if so, the river being improved above, would give us ample revenue to work on, and remove these obstructions.

But suppose we find some place on the river which steamboats cannot ascend? If steam cannot overcome it, machinery may, and to view it in its worst aspect, should we be obliged to change boats, and have passengers and baggage carried around such a place, still we shall have accomplished much.

All these remarks apply to passage boats. they are found to be capable of ascending worse rapids than tow boats. The latter, however, would soon follow the introduction of the former; and I have little doubt they can be turned to good account.

May I not hope, in conclusion, that this subject will engage the attention, draw out the energy, and stimulate the enterprise of the enlightened and patriotic sons of those lovely and fertile valleys! Ardently hoping it may.

I remain, dear sir, your obedi nt serv't,
E. B. HICKS.

M'GAULEY'S LOCOMOTION BY GALVANISM.

The announcement by the Rev. Mr. M'Gauley at the meeting of the British Association at Dublin last year, that he had invented a method of applying galvanism as a motive-power, has excited considerable interest in the mechanical world. The whole scheme has, however, come to no hing, as will be seen by the following statement of the proceedings upon the subject, which we extract from the *Athænæum's* report of the second day's (Tuesday, August 23d) proceedings of the Association at Bristol:—

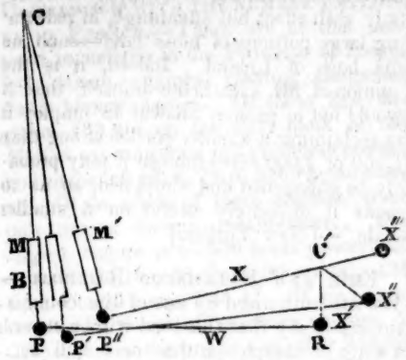
The Rev. J. W. M'Gauley read "A series of Experiments in Electro-Magnetism, with reference to its application as a Moving Power."

Previously to the detail of the experiments on this subject, he thought it migh be interesting to the Section to relate wha he had done since the last meeting of th Association, in the application of electr magnetism to machinery. He had inten led, originally, to have exhibited the im provements, but should content himself, fo the present, with the *detail*, rather than th *exhibition*. He was obliged to confess that he was the less anxious prematurel to publish results, since he found that th working model of last year, given to th S ct on, undoubtedly wi h the intention o its future improvement, or the pursuanc f experiments by other members, ha led, on several occasions, to the produc ion of papers, and the exhibition of m o- dels, by those from whom it might not b e expected—with a pretension to originality out with no change in the principle, and almost none in the details.

The working model exhibited to the Sections at the last Meeting of the Association must be acknowledged as a proof, to some extent, at least, of the applicability and the manageableness of electro-magnetism as a moving power; but the question then remaining, was, whether or not it was likely to be applied to useful purposes; for this, several things remained undone.

Powerful magnets were to be constructed. The ordinary formation of electro-magnets furnishes us, at best, with an apparatus clumsy in the extreme, and, as we shall see, of every limited power. This arises from the very nature of an electro-magnet; for the lifting power may be very great, although the attracting power at a small distance may be very trifling. There must be a limit, also, to the size of these magnets, for, if the mass of iron be too great for the helix, it is not saturated with magnetism, and the helix cannot be unlimited, as, beyond a certain distance from the iron, its action is nothing,—in some cases, perhaps, as we shall see, even injurious. The effective distance of the helix from the iron cannot be great, since its action, probably, decreases in the inverse proportion of the square of that distance. This difficulty cannot be obviated, as some have imagined, by causing the electrical currents to circulate through the mass of iron, uniting together a number of coiled bars. This would present an arrangement probably similar to a permanent magnet, the masses of iron acting on each other by induction, the reversion of the poles would be very slow, or altogether impossible. The *action* of the magnets, rather than their *masses*, must be united; but in this new difficulties occur. Their action must be simultaneous, or the machinery will be broken, or ineffective; the time *after* reversion, and during which a *bar can* be thrown off a magnet, is extremely short—hence one reason why it is difficult to unite the action of several magnets. But let us suppose that we have obtained a simultaneous reversion of the poles and throwing off of the bars—a thing totally impossible, he conceived, from he number and complication of circumstances by which it is influenced—how shall this action be applied to machinery? If the fly-wheel of a steam engine, m he shutting off of the steam, be mes in pelled by the engine while it co uninjured notion, it drags the piston oppose some- hrough the cylinder; but one position, hing to retain he piston wheel, the effect vithout stopping the this is exactly what vere highly injurious en in electro-magnets must frequently ha le to reverse the poles em. It is impossible, in s d a manner ven of one magnet, in s shall always hat the positi of the b on of the crank orrespond with the po nd fly-wheel. agnets, M M' be the

Let M M' be th h B, the bar, travels space though



in causing half the revolutions of the crank C′ X, while B is moving, so that its extremity shall be at P′; then C′ X shall have become C′ X″ while it is going to P″, C′ X′ shall become C′ X‴, but if when the crank C′ X is in the position of C′ X‴, one of the dead points, the bar is not ready to leave M′; or, in other words, if the magnet which holds it be not ready at once to send it off--a thing very probable; the fly-wheel continues to revolve by its own inertia, and the machinery is broken, or the bar is torn from the magnet, which often has a curious and perplexing effect on the reversion of the poles.

A better reversing apparatus was to be obtained. The one of last year, though perfectly successful, required the agency of mercury, which, for many reasons, is objectionable; it becomes oxidated, then contact is imperfect, and the level in the cups, which is of the last importance, is is destroyed: it is liable to a thousand accidents, not to speak of its destroying the wires of the apparatus itself.

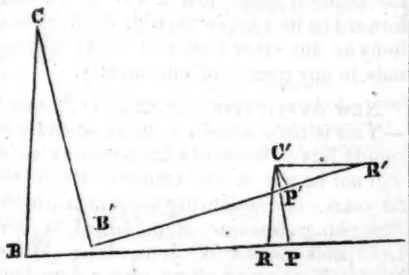
Again, the form of the apparatus, whether mercury be used or not, must be *changed*, and the *principle* of the one now exhibited to the Section adopted, since the apparatus, which will reverse the poles of one magnet, will not with speed or certainty reverse the poles of two or more, when worked by the engine itself. The apparatus shown to the Section had been used with great success in the reverson of the poles of four powerful magnets.

The attachment of the reversing apparatus to the machine becomes difficult, when more than one magnet is used, for reasons with which he would not then occupy the Section. He believed he might mention, that he possessed an engine of considerable power, in which these difficulties were overcome.

The experiments he should detail to the Section were numerous and complicated; he had taken every means to secure their accuracy; some of them appear anomalous, but were undoubtedly modified by circumstances, many of which are so obscure that he has not been able yet to develope them. He remarked, that it was obviously important to make experiments in considerable number, and on a large scale, since the former secures a greater accuracy, the latter the notice of results which, from their minuteness, might otherwise escape observation. His inquiries resolved themselves into two points—the nature of magnetism—the best means of producing it. The means of overcoming the difficulty arising from the necessarily limited size of the iron and the helix, he might probably treat at a future period.

[Mr M'Gauley then entered into a detail of his experiments]

Mr. M'Gauley thought it would be unbecoming in him to suggest any thing to the British Association; but he believed nothing would be more conducive to the interests of science, than that the Association should cause to be instituted a series of experiments on the galvanic battery and its charge, which would set all questions on the matter at rest for ever. Before he left this part of the subject, he thought it well to recall the attention of the Section to the nature of the power obtained by electro-magnetism. In steam one great cause of the varying power of the engine arises from the varying leverage of the crank. Let B and B′ be positions of the extremity of the piston-rod C′ R and C′ R′ corresponding positions of the crank, the leverage of the crank is measured by the perpendicular C′ P and C′ P′. It varies as that perpendicular But in electro-magnetism, the force at B say the bar traversing between the magnets, is always varying. He would now then enter into some curious results obtained by calculation on this matter.



He had been anxious to satisfy himself, by his own experiment, of the truth of the law of magnetic attraction being in the proportion of the inverse square of the distance, but abandoned the inquiry for the present, when he found that a magnet, with a seemingly appropriate bar, would lift at one-sixteenth of an inch only, five pounds; though with a different bar it lifted the same weight at twelve times the distance; and that the greater the distance through which powerful attraction might be exerted, the less the lifting power appeared.

In examining the identity of electricities derived from different sources, it seemed to Mr. M'Gauley that we sometimes forget that electricity may be modified both as to quantity and intensity; and that if either be changed, or both, we cannot expect the same results. To test, therefore, the identity of any agent with electricity, we must use those means which are the measure of, or dependent on, either quantity or intensity; for if in such experiments the electrometer or galvanometer be not effected, we only arrive at a negative conclusion—that if the agent under consideration be electricity, it differs from the ordinary electricity in quantity, intensity, or both. For though we never had been able with galvanism to cause the leaves of the electrometer to diverge, or with machine electricity to deflect the galvanometer, or with electricity to produce magnetism, or with magnetism, electricity, with electricity to produce heat, with heat, electricity,—their non-identity would by no means follow.—To examine with ease and certainty the identity of any thing with electricity, we must find some property of electricity, which is not modified by, nor dependent on, quantity or intensity. We know, and chemistry furnishes us with one proof, that the elements of things may be the same as to quantity and to the intensity of mutual action; and yet may be productive of vastly different effects. Thus we know, that from two equal volumes of carbon and hydrogen, may be formed at least three very different substances.

The following facts seem to afford additional evidence of the perfect identity of electrcity and magnetism; and that magnetism does not require, nor suppose, the circulation of electrical currents.

1st. A shock and spark are obtained by means of an electro-magnet only after battery communication is broken; for no matter how long this communication is maintained, neither shock nor spark shall be perceived. 2ndly. The shock and spark are not the effects of the battery; for to obtain a shock—(this shock he had not seen remarked by any experimentalist)—it is not necessary to form a part of the communication between the *copper* and *zinc*, but merely between the extremities of the helix, or between either extremity of the helix and the copper *or* zinc of the battery. 3rdly. The shock and spark do not arise from the magnetism of the bar included in the helix, since the more perfectly the bar is de-magnetised in breaking contact the better. Besides, it is curious that a powerful shock and brilliant spark may be obtained without any iron, and from a heap of wire thrown without any heliacal arrangement. This, Mr. M'Gauley remarked, would lead to a very simple and effective electrical apparatus, one easily managed, and always ready for use; the length and number of the coils, with a given calorimeter, has an effect on the shock and spark. Mr. M'Gauley exhibited to the Section wire coiled with the greatest accuracy, by a machine he had constructed, which was capable of covering any wire, manufacturing piano forte strings, &c., in any length, without any care on the part of the operator, to the enormous extent, if necessary, of 7000 feet per hour. The wire which is exhibited as several in the Section knew, was not more perfectly manufactured than the many thousand feet he had covered lately. He thought the shock and spark might arise in this way: a current of electricity passes through the wire from copper to zinc; its inductive action on the wire ceases suddenly, by the contact with the battery being interrupted; the disturbed equilibrium of the wire is suddenly restored. The electricity of the battery seems, in passing through the helix, to acquire an augmented intensity; but from these facts it is evidently not so. 4thly. The spark and shock appear to demonstrate that currents do not circulate

around the magnet. If they do, as is evident, they are capable, as we know from secondary currents, of producing a spark and shock. The helix, of itself, is capable of these effects; let the helix and the magnet act conjointly; these effects ought to be doubled; the contrary is the fact; they may be annihilated, and they ought, for the magnet, by its electrical action, retains the helix in a state of excitation. The universal—at least in other cases—law of electrical induction, if applied to magnetic phenomena, easily explains them. He did not think it by any means certain, that electrical action consists in the *transmission of a fluid*, and not the mere arrangement of particles: this idea seemed opposed by an experiment he made some time ago. He never could believe that the action of the galvanic battery consisted in the passage of electricity through the fluid from zinc to copper, and along the connecting wire from copper to zinc; he thought that the repulsion which sent the electricity through the fluid—an imperfect conductor—ought to prevent its return along the wire. He constructed a small box of wood, being a cube internally of three inches, divided it into twelve waterproof cells by well-cemented glass plates; placed in the cells six copper and six zinc plates, one in each, in the usual galvanic order; filled the cells with a charge of 1 in 50 sulphuric acid, 1 in 100 nitric acid and water, and connected the extreme plates wtth a delicate galvanometer, but no effect was produced, except when the copper and zinc were in the same cell, or the cells were in conducting communication; but he did not deem this experiment conclusive against his idea, since, although induction might occur from particle to particle, through an imperfectly conducting fluid, it by no means follows this inductive influence should take place through the particles of glass, since the very insulating power of glass, or other substances, may arise from the incapacity of their particles for electrical arrangement.

If it be true, that electrical effect is the arrangement, and not the transmission, of particles, he thought we might easily understand the agitation of the muscles of a frog, caused in *breaking* contact with a galvanic battery, even of a single circle; the dangerous effects to those in the neighborhood of the discharge of lightning from cloud to cloud; and the spark and shock obtained from a quantity of wire—all of which probably arise from the same cause, and are the consequence of the same universal law.

Professor Ritchie rose to remark, that without intending to convey the least censure on the gentleman, he could not but observe, that he had been so entirely occupied with his own reseaches as not to have attended to any thing done by others, for there was really nothing new in this paper—and he gave examples.

Professor Stevelly, remarked, that if the only objection to it were the crank and magnetic pendulum not working together, in a large machine that could be at once remedied, by what was well known in practical mechanics, a slipping coupling, as, when the steam-engine and water-wheels were made to work together, was generally done, as in the winding part of the common clock. The great objection was the small distance through which the power worked, one-sixteenth of an inch; thus, even if a magnet could be produced that would lift 1,000 lbs., would still render the numerical value of the horse-power almost evanescent compared with the steam-engine.

Items.

CENTRAL RAILROAD.

We are gratified to learn that the Assistant Engineer of the Central Railroad has been engaged recently in laying off a portion of the Road, commencing at the public lot at Spring Hill, five acres of which have been generously granted to the Company by the City Corporation for a depot.

There are now about seventy men at work on the Road, and others will be added to the number as rapidly as the surveys and location of the Road will permit. Mr. Randall, the Chief Engineer, is daily expected, and from his known character for energy and perseverence, we may look for the vigorous prosecution of this great work. We congratulate our fellow-citizens upon the active commencement of this favorite work, under circumstances which leave not the slightest doubt that it will be carried forward to its completion with as much belerity as any other work of the like magnitude, in any portion of our country.

NEW APPLICATION OF STEAM POWER.—This is truly an age of wonders, and we should like to know to what purpose steam will *not* be put in the course of the next 50 years. The following account of *Steam Ploughing Machine*, is published in the Liverpools papers of June 1st. Wide awake, Farmers, nothing now a-days but steam;

"Some experiments were tried on Friday week at Red Moss, near Bolton, in this county, in the presence of Mr. Handly, M. P. for Lincolnshire, Mr. Chapman, M. P. for Westmeath, Mr. Smith, of Deanston, and other men interested in agriculture, with a complete and very powerful steam-plough, constructed by Mr. Heathcote, M. P. for Tiverton. About six acres of raw moss, were turned up in a few hours, and turned up in a most extraordinary style; sods eighteen inches in breadth and nine inches in thickness being cut from the furrow, and completely reversed in position, the upper surface of the sod being placed exactly where the under surface had been before. The possibility of ploughing by steam has thus been established, though, as the employment of the steam plough, in preference to one drawn by horses, will depend on the comparative cost of the two powers, and on that of the implements used, and as there are not at present any sufficient data for judging what the difference of the cost will be, it is not possible to say how far steam is likely to be applied to this department of agriculture. The plough of Mr. Heathcote, though a very powerful machine, appears to us to be much to complex and costly for common agricultural purposes, though we have little doubt that it might be used not only with effect but advantage, in redeeming large portions of moss land—such as the bogs of Ireland. Indeed, it is the opinion of Mr. Heathcote himself, that it would not at present answer to employ it in reclaiming a smaller portion of bog than 1,500 or 2,000 acres though it may probably be cheapened and simplified, so as to make it ultimately useful on a smaller scale."—[New Yorker.]

ERIE AND KALAMAZOO RAILROAD.—We are authorised by one of the commissioners to say that this road will be in such a state of completion that cars will commence running by the 10th or 15th of next month, through the whole line from Adrian to Toledo. We are also informed that cars now leave Toledo every morning at 9 o'clock and arrive at Sylvania at 11 o'clock A. M., leave Sylvania at 2 P. M. arriving at Toledo 4 o'clock same day. Persons travelling between this place and Toledo would find it to their advantage to meet the cars at the above places.—[Adrian Watch Tower.]

DANVILLE AND POTTSVILLE RAILROAD.—The Sunbury Advocate of October 22d says:—A new era is about to commence in Shamokin. We are much pleased to announce the arrival here, on Saturday last, of two cars on the Sunbury Railroad, laden with coal from the coal mines of Shamokin. The coal are of the best quality, and were promptly bought by Charles G. Donnel, Esq. and Geo. Prince, at $3 50 per ton. The cars since run regularly, bringing coal for sale at the basin, in front of Sunbury. Many more cars, we are told, will shortly be placed on the road.

THE LONDON GRAND JUNCTION RAILWAY.—The first general meeting of the Directors and Shareholders of the Company, since their incorporation, took place on Wednesday, at the city of London tavern, Bishopsgate street, to afford the Directors an opportunity of laying before the Proprietors a statement of the affairs of the company. The chair was taken by Sir S. Whalley, M. P., at which time there was a full attendance of the largest holders of scrip issued by the company. Sir S. Whalley addressed the meeting at great length, in vindication of his conduct and that of the Directors, in reference to certain charges that had been brought against them for trafficking in shares. The report gave an estimate of the probable amount of traffic, and the cost of maintaining the railway, etc., from which it appeared that a profit of 20 per cent was expected to result from the undertaking. A resolution was unanimously agreed to, to the effect that the explanation of the chairman was most satisfactory, and that the Directors deserved unqualified confidence.—[Chronicle.]

RAILROADS IN RUSSIA.—A railroad has just been completed, and will be opened in October, from St. Petersburgh to Jaroslav, Jeselo and Pawlowsky; and from the two others are to be commences of Petercapital to the imperial re M. Gerttner is hoff and Oramenbaum orks, and has lately the engineer of these improve himself in railbeen in England t way matters.

STEAM ENGINES IN BELGIUM, AND COMPARISON WITH THE NUMBER EMPLOYED IN FRANCE.—There are at this moment in activity in the Province of Liege, 216 steam engines, exerting altogether 5445 horses' power. Of these 216 engines, 139 are on the right bank of the Meuse, exerting equa to 2176 horse power; and on the left bank, 79, or 3269 horse power. Of the whole of these engines, three only are of foreign manufacture. The largest engine is of 300 horse power; 20 from 50 to 10; 38 from 20 to 50; 139 from 5 to 20; and 1 of 1½. If we join to the motive power of the steam engines of Liege, that of the engines in other Belgian provinces, a total would be formed of about 20,000 horse power. It is principally in Hainault, about Charleroi, and in Borinago that the largest engines are found. According to the reports published by the *Administration des Ponts et Chausees*, in France, there are 946 engines, representing not more than about 14.051 horse power. Belgium thus surpasses by about one third the power of all the steam engines in France. Upon this foundation, therefore, and comparing the respective population of the two countries, we find that Belgium industry is twelve times more developed than French!—[Receuil Inndustriel]

GRAND JUNCTION RAILWAY (CONNECTING THE BIRMINGHAM, AND MANCHESTER AND LIVERPOOL RAILWAY.)—On Wednesday last, the 31st ult., the annual meeting of the Proprietors of this Railway Company was held. A very able Report of the proceedings of the Company since their last meeting was read by their Secretary, Mr. Chorley, which gave general satisfaction. The whole of the line is in so forward a state, that it is expected it will be open for travelling early in the summer of 1837.—Fourteen of the twenty arches of the splendid viaduct across the Weaver are finished; it, as well as the viaduct near Birmingham, will be completed next spring. There are several parts of the line ready for the iron rails being laid down. All the carriages are in a forward state, and 25 locomotive engines will be ready for action in March. The contracts for the rails and chairs were made at a fortunate period, being at 15 per cent. less than they could now be obtained for. The income derivable from the Warrington and Newton Railway, now forming part of the general line, yields a surplus after paying the recent proprietors the sum of 4 per cent. per annum, as agreed upon to be paid to them until the opening of the whole line. The proprietors were unanimous in their desire to support the line between Manchester and Crewe, and to assist the inhabitants of the Potteries to form a branch line to the Grand Junction Railway near Newcastle.

NAVIGATION OF THE DELAWARE AND CHESAPEAKE CANAL BY STEAM.—The steamboat Car of Commerce left the wharf on Thursday afternoon with a pleasant party of about fifty persons, of which we made one, on an excursion down the Delaware, to try this splendid boat. She is a fine affair, and passed down as far as Chester and back again, to the entire satisfaction of all on board, and fully answering the expectation of her enterprising owners, who have got up this experiment of navigating the Delaware and Chesapeake canal by steam; whereby passengers can step on board of this boat, and be landed in Baltimore in about twelve hours, without the trouble and expense of changing from boat to car, and from car to boat, as is the case in the old line between this and our city. We congratulate the citizens of Philadelphia and Baltimore on the prospect of a daily line of steamboats through this channel, to two large commercial cities, at a reduction of *one-half* of what they are now *compelled* to pay. If this boat will pass the locks of the canal without any difficulty, as we have every reason to believe she will, when this experiment will be successfully triumphant; and such is the sanguine expectation of the managers, backed by public opinion, that they have already commenced building another boat. The Car of Commerce has an engine of about 60 or 70 horse power, constructed on the locomotive principle, and was built under the eye of her projector, Captain E. W. Crocker, who has the command of the boat. She will carry about one hundred tons freight, and one hundred and fifty passengers, and is calculated to run from city to city in about twelve hours.—[Philadelphia Ledger.]

BOSTON AND NOTTINGHAM.—This railroad appears to be a decided favorite with the public.

BRIGHTON.—Another scheme is to be brought forward, founded on surveys taken in 1823, by a person who competes for the honor of originating the Liverpool and Manchester railway.

COMMUNICATION WITH IRELAND.—Great efforts are making to secure the shortest line between the capitals of England and Ireland. A considerable difference of opinion exists as to the best route and harbor. At present nothing seems to be fixed on.

DOVER.—The line is commenced near Oxford. This looks like business. They find it necessary to apply to Parliament next session to amend their line between London and Oxford, it being said that the line granted by parliament is either such as could not be executed, or, if executed, could not be worked to any profit Fifty thousand pounds is said to be a moderate estimate of the expenditure of this and the rival Companies before the bill was obtained.

PRESTON.—A railway is now forming from the harbor of Wyre to Preston, and at the former place a town will soon arise, named New Liverpool. Wyre is thirty miles from Liverpool. The difference in the respective port charges of Old and New Liverpool are considerable. The following account of dues at each are calculated on an American vessel of 300 tons, making two voyages a year, viz: Liverpool, £224 19s.; New Liverpool, £11 5s.

GRAND JUNCTION RAILWAY.—It is proceeding with great rapidity towards its completion. The men are at work day and night, and the engineer (Mr. Locke) has it in contemplation to throw open the line for travelling next summer. Fifteen splendid carriages have already been completed.

LEEDS AND SELBY.—At the annual meeting of the shareholders it was stated that the traffic in every department is steadily on the increase, and the prospects are good. The dividend for the year was declared at £1 10s. a share.

MANCHESTER AND LIVERPOOL.—The company have discontinued the publication of their half-yearly reports.

GREAT NORTH RAILWAY.—A resolution has been passed to apply next Session for an Act to complete the line from Croft to York, so as to perfect the communication between Newcastle and London. The number of directors is eighteen, and they are to be paid eighteen guineas a week for attendance.

NORTHERN AND EASTERN.—The works are to be commenced without delay, and completed within two years. The line from London to Waltham Cross will be completed within a year after possession of the land; and the whole distance to Cambridge in two years.

NORTH UNION.—There are upwards of 900 men employed between Wigan and Preston, and generally the works are progressing with rapidity; especially the magnificent bridge over the Ribble. It will be exactly like Waterloo Bridge, but with five arches. These will be 120 feet span, and are in a state that renders completion by the spring of 1838 almost a matter of certainty.

Mr. Pinkers has commenced operations on the formation of a line of the Pneumatic Railway, near the banks of the Kensington Canal, and he expects to be able, within two months to demonstrate his method of working a line of railway.

Bills were obtained during the late session of Parliament for near 1,100 miles of road, requiring for rails, chains, carriages, and other works, at least 220,000 tons of iron, independently of that required for roads for which Bills have been previously obtained, and are now in active preparation. These will amount to about 70,000 tons, making a total of 290,000 tons, probably in requisition for the next four years. Railroads in the United States, either actually under contract or in progress of survey, amount to more than 3,000 miles, and will take 750,000 tons. The whole of this iron must be taken from the British market.—[Railway Magazine.]

POWER-LOOMS IN GLASGOW have increased greatly of late years—some idea may be obtained of the extent of their use when it is known that in 1831 four houses employed 3040 looms. These looms, on an average, weave 14 yards each per day. Allowing each loom to work 300 days in a year, these four companies would throw off 10,101,000 yards of cloth, which, at the average price of 4½d. per yard, is 189,393*l.* 15*s.* per annum. The power and hand-looms belonging to Glasgow in 1831 amounted to 47,127, viz. steam-looms, 15,127; hand-looms, in the city and suburbs, 18,537; in other towns, for Glasgow manufactures, 13,463. Since that period power-looms have greatly increased.—[Athenæum Report of Meeting of British Association.]

COTTON TRADE IN GLASGOW.—The manufacture of linens, lawns, cambrics, and other articles of similar fabric, was in-

troduced into Glasgow about the year 1725, and continued to be the staple manufacture till they were succeeded by muslins. On the 21st of July, 1834, Mr. Leonard Horner, one of the Parliamentary Factory Commissioners, reported to Parliament, "That in Scotland there are 134 cotton mills: that, with the exception of some large establishments at Aberdeen, and one at Stanley, near Perth, the cotton manufacture is almost entirely confined to Glasgow and the country immediately adjoining, to a distance of about 25 miles radius: and all these country mills, even including the great work at Stanley, are connected with Glasgow houses, or in the Glasgow trade. In Lanarkshire (in which Glasgow is situated) there are 74 cotton factories; In Renfrewshire, 41; Dumbartonshire, 4; Buteshire, 2; Argylshire, 1; Perthshire, 1. In the six counties there are 123 cotton mills, nearly 100 of which belong to Glasgow."

Granite Polishing Machine.—We have for sometime past been watching the progress of a machine for polishing granite, worked by a steam engine, invented by Mr. Alexander M'Donald, stone cutter, of this town (Aberdeen.) Splendid pedestals, urns, tables, columns, and chimney pieces, have been polished and glossed in a most beautiful manner. It has hitherto been believed, that the blue grey granite from the best quarries in this neighborhood, Rubislaw and Dancing Cairn, would not receive such a fine polish as the red granite from Peterhead: but the operations of M'Donald's machine has completely belied this.—[Aberdeen Observer.]

Iron Works in Scotland in June, 1836.

Erected in or about year	Furnaces.	Tons.
1767, Carron Comp.	5	8,000
1786, Clyde	4	12,000
1786, Wilsontown,	1	3,000
1790, Muirkirk,	3	6,000
1790, Cleland	1	2,500
1790, Devon	3	7,000
1805, Calder	5	15,000
1805, Shotts	1	3,000
1825, Monkland	3	8,000
1828, Gartsherrie	5	15 000
1834, Dundyvan	4	12,000
Total.	35	92,000

Exclusive of the above furnaces, there are eight additional ones in a state of forwardness—viz. two at Gartsherrie, one at Calder, one at Monkland, two at Somerlie, and two at Govan. These eight furnaces will make about 20,000 tons annually.—These works are all in the neighborhood of Glasgow excepting five, and none of them are thirty miles distant from that city.—[Athenæum Rep. of Meeting of British Association.]

St. Rollox Chemical Works.—This manufactory, for the manufacture of sulphuric acid, chloride of lime, soda, and soap, the most extensive of any of the kind in Europe, covers ten acres of ground, and within its walls there are buildings which cover 27,340 square yards of ground. In the premises there are upwards of 100 furnaces, retorts, or fire-places, and in one apartment there are platina vessels to the value of upwards of 8 000*l*. In this great concern, upwards of 600 tons of coal are consumed weekly.—[Ibid.]

Submarine Illumination by the Drummond Light.—We find by the Irish newspapers, that Mr. Steele, who has devoted himself with so much ardor to the subject of submarine operations, and who is the inventor of the communicating diving-bell, has lately made a very important improvement in this department of physical science. This improvement consists in the substitution for the light which he originally proposed for the irradiation of objects under water, of what he calls "the piercing ray of the Drummond light in its gorgeous glory." He has consulted several highly distinguished engineers of this metropolis, and they have been unanimous in their opinion, that this new application of the Drummond light is an improvement of the greatest importance, and it is impossible that any thing can be more simple than the mode proposed by Mr. Steele for its application to his purpose. It appears from the Irish newspapers that this improvement in his theory was made by him while observing Mr. Deane's operations at Kilkee, on the coast of the county Clare. We have seen several of Mr. Steele's publications on this subject in the journals of our Irish contemporaries, and he writes in terms of measureless admiration of the infinite beauty and perfection of Mr. Dean's system of rapid diving. Among the London engineers who have expressed the highest approbation of Mr. Steele's new theory of submarine irradiation of the Drummond light, is, we understand, Mr. Alexander Gordon, who has particularly applied himself to the subject, and lately obtained a patent for a very beautiful mode of generating and applying the oxy-hydrogen gas.—[Sun.]

Irradiation of Light.—It is a curious fact, that if the same letters of the same size precisely are painted on two boards, the one white on a black ground, and the other black on a white ground, that the white letters will appear larger and be read at a greater distance than the black. This is owing to what is called the irradiation of light. It depends on this, that the impression made on the bottom of the eye by bright objects extends a little wider than the actual portion of the organ struck by the light, and invading the space occupied by the darker objects makes the brighter appear larger than they really are.—[Railway Magazine.]

Technological Collection of the Emperor Ferdinand of Austria.—A predilection for the study of rural economy and technology has induced his Majesty to form a collection of raw materials, of manufactures, and of objects of industry of the Austrian States. This he has executed with so much precision and care, that the collection may now be cited as one of the most perfect in the world. It comprehends three principal classes:—1st, a collection of raw materials; 2nd, a collection of manufactures; 3rd, a collection of models. The first consists of all kinds of unmanufactured products, to the number of 3300; the second, all articles of manufacture or labor, and is very complete; it is interesting not only in a technological point of view, but also for the manner in which the objects are arranged; that is, in the order of the different countries and different manufactures of the empire. The collection of models is divided into seven sections. The number of articles exhibited at the commencement of 1835 was about 40,000.—[Recueil Industriel.]

Steam Voyages.—The longest steam voyage undertaken at present is from Falmouth to Corfu, being 1,900 miles, and is accomplished at an average speed of seven miles and a half an hour.

Rapidity of Communication.—A late number of the Liverpool Courier gives us some extracts from the official log-book, kept at the Liverpool Telegraph Office, and by it we are in possession of instances of such extraordinary rapidity of communication, as appears almost incredible. It appears to be a rule in this office frequently to send a communication exactly at one o'clock, through the whole line from Liverpool to Holyhead, in order that the different signal men may regulate their time pieces; this is done by a peculiar signal made exactly as the clock strikes *one*, which notifies the time, and asks the question, "Is there anything to report?" An acknowledgement or answer to this is returned, either "yes," or "no," as the case may be. The distance from Liverpool to Holyhead, from station to station, is seventy-two miles, hence there and back 144 miles, and this signal and answer is considered unusually long if it occupies *one minute!*

Pigeon Despatches.—Much having been said about "pigeon expresses," and the cypher employed for the intelligence conveyed by them, a specimen of one of them may not be unacceptable. It was taken about two months ago from a pigeon shot near Folkestone, and was found fastened to the tail of the bird. The despatch was from London, intended for Paris, and runs thus:—

"London, August 2.
"pziy. pzig, pkim, pkky.
"35152316 ky.
"> gg a gz im.
"Do not forget 2534,242131.

"There have been fluctuations at Amsterdam, ascribed to the illness of Mr. Rothschild. Here it is said that he is dead and to that is attributed 2214 35 15 2316634. The Paris prices were known here at 4, but I think the removal of Cordova the cause that there has not been a greater sensation. Perhaps coupons or 31112 7241035, 1235,3424172617."

On the outside:—

"Aug. 3.—Sent off 3 pigeons; have left."

History of Telegraphs—Bryant Todd, Esq., an intelligent navigator and merchant of Boston, whose authority as a practical man gives no greater weight to

his statement and opinions, publishes the following:—

"The first time—by way of illustration—I experienced the advantage of flag conversation was in the year 1815. We saw five big ships spread in line, by *signal* orders, to prevent our passing them. Having proper documents to inform of peace, we ran up colors and stood for the centre ship. The boarding officer, on being satisfied, said 'Run up your ensign in the fore rigging: that is our signal agreed upon to inform the squadron that *peace between our nation has been made*; and it will save you the trouble of being overhauled and detention.'

"After informing the officer of Bonaparte's escape from the Island of Elba, he directed to hoist the ensign in the main rigging, saying, "that is a signal to *inform of news*.' The seventy-four, and four frigates, were at the time sailing in a lazy cruising manner, but immediately on seeing our last signal, the admiral began conversation with the fleet; and, as if by magic, up went top gallant yards and booms, and in twenty-four minutes they were under a crowd of canvass. The officer, seeing the signals from the Admiral, said, '*That is for me to go on board, and for all hands to get to Old England as soon as we can.*' Without these *talking* flags, it would have taken hours to have communicated three such important points by means of boats or otherwise.

"One more instance happened a year before the last, when I was going in company with several English captains, from Macao to Whampoa, in an English schooner packet. When in sight of the shipping tide turned down river, and it being calm, we came to an anchor. Fortunately the packet had conversation flags, and, on signal being made, down came four boats to take us up to Canton, where, otherwise, we should not have reached until the next tide.

"Sometimes a boat cannot live upon the sea, and it may blow a gale, which prevents speaking. Our *conversation flags* in such cases, obviate all difficulties."

TRACES OF ANCIENT CIVILIZATION AMONG THE SOUTH SEA ISLANDS.—Amongst the Caroline Islands, only six weeks sail from Sidney, is Ascension (about 11 degrees north latitude,) discovered very lately by his Majesty's sloop of war Raven. Mr. Oug, now a resident of this colony, some years back remained there for several months, and we have our information from a friend, who conversed frequently with Mr. Oug on the subject. On the above named island of Ascension the language of the inhabitants is more harmonious than in the other islands of the South Seas, a great many words ending with vowels. There are at the northeast end of the island, at a place called Tamen, ruins of a town now only accessible by boats, the waves reaching to the steps of the houses.

The walls are overgrown with bread, cocoa-nut, and other ancient trees, and the ruins occupy a space of two miles and a half. The stones of these edifices are laid bed and quoin, exhibiting irrefutable traces of art far beyond the means of the present savage inhabitants. Some of these hewn stones are 20 feet in length by 3 to 5 each way; and no remains of cement appear. The walls have door and window places. The ruins are built of stone, which is different from that occurring in the immediate neighborhood. There is a mountain in the island, the rocks of which are covered with figures, and there are far greater ruins eight miles in the interior. The habits of these islanders exhibit traces of a different social system; the women do not work exclusively, as is the custom in the other island. After the meals water is carried about by servants for washing hands, &c. Asked about the origin of these buildings; the inhabitants say that they were built by men who are now above, (pointings to the heavens.)—[Hobart-town Courier.]

INSECTS.—Dr. Imhoff, in a work presented to the Society of Natural History, at Bale, has estimated the number of insects now known at 560,000 species, Germany alone containing 14,000.

NATURAL HISTORY OF MISSOURI EARTHQUAKE.

We make the following extract from an interesting letter, recently written by Dr. Linn one of the United States Senators from Missouri, to the Hon. John Davis, Chairman of a Committee of the Senate, on the subject of removing obstructions in the St. Francis, White, and Big Black rivers, which, taking their rise in Missouri, run nearly parallel with the Mississippi for some hundreds of miles, and finally unite, far down in Arkansas, with the 'Father of Waters.'

The memorable earthquake of December, 1814, after shaking the valley of the Mississippi to its centre, vibrated along the courses of the rivers and valleys, and, passing the primitive mountain barriers, died away along the shores of the Atlantic ocean. In the region now under consideration, during the continuance of so appalling a phenomenon, which commenced by distant, rumbling sounds, succeeded by discharges as if a thousand pieces of artillery were suddenly exploded, the earth rocked to and fro, vast chasms opened, from whence issued columns of water, sand and coal accompanied by hissing sounds, caused perhaps, by the escape of pent up steam, whilst ever and anon flashes of electricity gleamed through the troubled clouds of night, rendering the darkness doubly horrible. The current of the Mississippi, pending this elementary strife, was driven back upon its source with the greatest velocity for several hours, in consequence of an elevation of its bed. But this noble river was not thus to be stayed in its course. Its accumulated waters came booming on and overtopping the barrier thus suddenly raised, carried every thing before them with resistless power, Boats that floated on its surface, shot down its declivity like an arrow from a bow amid roaring billows and the wildest commotion. A few days action of this powerful current sufficed to wear away every vestige of the barrier thus strangely interposed and its waters moved on in their wonted channels to the ocean. The day that succeeded this night of terror, brought no solace in its dawn. Shock followed shock; a dense black cloud or vapor overshadowed the land, through which no sunbeam ever found its way to cheer again the desponding heart of man, who in silent communion with himself, was compelled to acknowledge his weakness and dependence on the everlasting God. The appearance which presented themselves after the subsidences of the principal commotion, were such as strongly supported an opinion heretofore advanced. Hills had disappeared and lakes were found in their stead; and numerous lakes became elevated grounds over the surface of which vast heaps of sand were scattered in every direction, whilst, in many places, the earth for miles, was sunk below the general level of the surrounding country, without being covered with water, leaving an impression in miniature of a catastrophe much more important in its effect, which had, perhaps, preceded it ages before.

One of the lakes formed on this occasion, is sixty or seventy miles in length, and from three to twenty miles in bredth. It is in some places very shallow; in others, from fifty to one hundred feet deep; which is much more than the depth of the Mississippi river in that quarter. In sailing over its surface in the light canoe, the voyager is struck with astonishment at beholding the giant trees of the forest standing partially exposed amid a waste of waters, branchless and leafless. But the wonder is still further increased on casting the eye through the dark-blue profound, to observe cane-brakes covering its bottom, over which a mammoth species of testudo is occasionally seen dragging his slow length along, while countless myrids of fish are sporting through the aquatic thickets. But if God in his wrath has passed through this devoted land, if he touched the mountains and they disappeared in the abyss, his beneficient influence is still felt in the soft climate, the unexampled fertility of its soil, the deep verdure of its forests, and the choicest offerings of Flora.

FIRE PROOF STAIRCASES.

Sir,—Among the various schemes for preventing the sad havoc which is so frequently the consequence of fires, (in too many instances attended with loss of life or mutilation of limb,) that which to me appears the most simple and the most efficacious, is scarcely ever noticed, and I much fear will never be acted upon generally without legislative interference—I mean the construction of incombustible staircases. I am a builder in a small way, and being an operative mason, have always, without reference to the size of the house, put stone, or stone and brick to the first floor; even in fourth rate houses this

is quite easy, and little more expensive than wood. Two courses of brick for riser and a rubbed York tread with the nosing rounded; the bricks faced with cement, and when dry painted stone color. This looks well, and is lasting. Nearly all fires originate in the lower part of the house; and a moment's reflection will convince every one of the difficulty of the flames reaching and burning through a ceiling eight or nine feet high, except by means of communication afforded by the wooden staircase. Above the first floor, stone staircases, unless geometrical, are more difficult, on account of the necessary support taking up too much room. My present object is, however, to point out the advantage of having the lower staircase fire proof, which perhaps would, in 99 cases out of 100, prevent the fire reaching higher if it commenced on the ground floor, or afford an easy mode of escape should the fire take place in an upper story.

I remain, Sir,
Yours, very truly,
P. Rayner.

Obelisk, Sept. 5. 1836.

A SIMPLE METHOD FOR DRAWING ON BOTH SIDES OF A BOARD WITHOUT EITHER BEING RUBBED.

Sir,—If the simplicity of any plan do not take away from its utility, perhaps the following contrivance (which occurred to me from reading one which had the same object in view in your Magazine,) may on that score be acceptable. It is not at all unusual for draftsmen to be working at two different drawings at the same time; and in this case it would be very convenient to make one drawing board answer in the place of being obliged to have two.

To effect this, I think that two slips of wood of the same thickness, provided with pins, say two at each end, and these made to fit in corresponding holes in the drawing board at top and bottom, would be sufficient for the purpose. By these means a sheet of paper could be laid on both sides the board, and be used at the same time, by reversing the pieces of wood from one side to the other, as occasion may require. The holes should be near the edge of the board to allow as much room as possible for the paper.

I cannot vouch for the originality of the above, as being so plain it may have occurred to, and even been adopted by many; but it has not come under my observation.

I remain, Sir,
Very respectfully yours,
Frederick Lush.

August, 1836.

SUBSTITUTE FOR LIGHTHOUSES ON THE SHORES OF THE BLACK SEA.

TRANSLATION OF A NOTE ADDRESSED TO THE BRITISH AND OTHER FOREIGN AMBASSADORS AT CONSTANTINOPLE, IN DECEMBER, 1829. BY COL. MACERONI.

From the highest antiquity, the Black Sea has had the melancholy celebrity of being the most dangerous of all those which have been, or are at present, frequented by navigators! Thus it was named by the Romans, "Axenus" *sive inhospitalis*. The nature and the direction of the winds which predominate – the formation of its coasts and shallows—of its very ports and its atmosphere—present innumerable dangers, even in summer; in the winter these perils are augmented a hundred-fold! Since the 1st of last November, no less than eleven out of twenty-three vessels, which have sailed between this port and Odessa, have been miserably lost!

By the aid of lighthouses placed on dangerous places, or at the entrances of harbors, the navigation of ships in the vicinity of shores is greatly aided during the darkness of the night. But unless such lights be sufficiently refulgent and *elevated*, and unless the atmosphere be sufficiently clear to permit of the lights *being seen at a sufficient distance*, it often happens that the unhappy sailor does not discover them in time to avoid the dangers which they indicate, or to enter the harbor of which they announce the entrance!

The dangers of the Black Sea are greatly enhanced, and indeed mainly consist, in the dense and sudden fogs which cover its surface. It would be very easy to account for the formation of these fogs by referring to the currents of cold air, which, suddenly rushing from the north-east, meet the warm and moist atmosphere confined within the mountainous margins of the Black Sea.—But this disquisition is not to my purpose, because no remedy can be offered for an exhibition of the laws of nature depending on geographical features of locality. The fact is, that whenever a north wind blows, especially in the autumn and in winter, the Black Sea is covered with an almost impenetrable mist. The course of a vessel steering from Odessa to Constantinople is from north to south. If a strong wind prevails, and the mouth of the Bosphorus be missed, owing to mist or darkness, the rounding of the southern coast causes the unhappy vessel to find itself almost immediately with a lee-shore a-head, upon which it rarely escapes being driven and totally lost!

It is absolutely necessary that the entrance of the Bosphorus should be recognised *at a very considerable distance*, because if it is overshot, with a strong north wind blowing, perdition is sure to follow. The amount of lives and of property annually lost in this way is truly appalling! Twenty-seven vessels, and their crews, have thus perished since I have resided in this capital! It seems that, when in a gale of wind from the north (always accompanied by a mist) if the entrance of the Bosphorus be once overshot, there is no further hope.—The low, shelving southern coasts of the Black Sea offer no other refuge, or none can be discerned.

To the evils above sketched out I propose to apply a palliative. Lighthouses are admirable constructions; but they are expensive, and require time to erect. Moreover, on a low coast it is not easy to give them that degree of elevation which will ensure their being descried at a sufficient distance. Besides which, the case is urgent, and a remedy is called for *at this very moment*, while we daily and hourly receive the afflicting accounts of loss of life and property to an enormous amount.

The expedient which I propose is the use of rockets, projected vertically in the air during a storm, from such points as it is essential to designate to the bewildered navigator. A six-pounder rocket, properly made, will rise above 1000 yards perpendicularly in the air. At that elevation the head or pot is made to burst, and about half a pound of combustible composition, of a most refulgent brightness, is detached from the rocket, and burns suspended in the air for about one minute. This light is far more intense than any of the lamps of the best lighthouses; and its very superior elevation (being *thirty times* higher) causes it to be perceived at a much greater distance. Moreover, its sudden appearance, and the manner of its combustion, can never allow of its being mistaken for some fire on a mountain; and the same suddenness strikes more attention than any fixed light whatever. By means of a little parachute, invented by Sir W. Congreve, the cage containing the refulgent light is suspended in the air so as to fall a very few yards during the period of its combustion. I have discovered a composition which gives much more light than any hitherto used.*

Depots of such rockets should be formed at the necessary points, only to be sent up on the occasion of a storm by night. One may be fired every five or ten minutes; and as the number of stormy nights in the year does not average more than thirty, and that not during the whole night, the consumption of rockets would not be an expense of national importance. When rockets are projected from more points than one, the locality may be indicated by a difference in the color of the light. Some may give a red, a green, a white, or a blue light. To cover the expense, a small tax or toll might be exacted from all vessels navigating the Bosphorus and the Black Sea; which I suppose they, or their respective Governments, would gladly submit to, in consideration of the great advantage received. I am ready to give directions and exhibit experiments, to prove the merits of my plan quite gratuitously.

(Signed) Maceroni.

Extinguishment of Fires at St. Petersburgh.—The following article, in relation to the extinguishment of fires, is from a new publication, by M. Von Tietz, Prussian Counsellor of Legation, to St. Petersburg Constantinople and Napoli di Romania:—"In every district in the city (St. Petersburgh) there are several police stations, wherein fire engines are placed, with high towers, upon the galleries of which there are two watchmen. So soon as these observe a fire break out by ringing a bell, they apprise the firemen beneath, who immediately hasten to the spot.

* His Excellency General Count Guilleminot, the French Ambassador here, has seen me set fire to and consume a cypress tree with one of my compound naval rockets, at 1000 yards distance horizontal range.

In whatsoever portion of the city the fire happens to be, it is indicated upon the towers alluded to. For every district a peculiar set of figures is exhibited as a kind of telegraph; at night this is done by lanterns. Every body of firemen has its distinct time appointed, even to a minute, by which to reach the place of fire. The whole are organized and equipped like a regiment; and have no other occupation besides this. They are exercised every week, sometimes a wooden building of light construction, at some distance from the city, is set on fire, in order to instruct the men in the practical service. The mounting of the machines is excellent, and the entire arrangements for extinguishing fire appropriate, and indeed elegant. Of these, the most useful are the fire ladders, which can be drawn up with great ease, to the highest story of a house. Equally servicable are the large nets, held extended to receive those persons who can only be saved by springing down into them: this manœuvre is constantly practised by the firemen in order to gain dexterity; and hitherto, on adopting it, they have always been fortunate enough to save the individuals without incurring any accident. In the severe frost of winter, in order to prevent the water from freezing, certain preparations are made under the navigable reservoir, for receiving but hot coals. It is interesting to observe at fires the strict regularity with which the subordinates obey the orders of their officers, and the death-defying intrepidity wherewith these grave, powerfully formed men dash into the devouring element, fearlessly scrambling along the narrow paths on the tops of the flaming houses. The Emperor always remembers, after each event of this kind, to reward them by some liberal donation."

From the Poggendorf Annalen.

PRODUCTS OF THE DISTILLATION OF PIT COAL.

By F. F. Runge.

From the oil of pit coal rectified over oxide of copper, three bases and three acids are partly separated, or are partly formed, which differ in their chemical properties from any substances hitherto observed.

BASES.

1. *Cyanol* (blue oil) is a volatile substance almost destitute of any peculiar smell, neutralizing acids and forming salts which partly crystalize. It produces in a solution of muriate of lime a blue color, which is removed by an excess of chlorine. The salts of cyanol dissolve in solutions of muriate of lime, producing a fine violet blue color, which by free chlorine is converted into orange. They impart to the colorless solution of the white pith of the elder and pine wood, an intense yellow color, which is not destroyed by chlorine, at least under the circumstances in which other organic colors disappear. Thus, a piece of Turkey red cotton speedily loses its color, when after being moistened with oxalic or tartaric acid, it is immersed in a solution of muriate of lime. Paper, cotton, linen, wool, and silk are not colored yellow. The effect of the salts of cyanol in coloring pine wood is so strong, that a drop containing only one five hundred thousandth part of cyanol produces a distinct yellow color in the wood. The yellow coloring is not imparted to the fibrous part of the wood, but to a peculiar matter in the wood which also exists in other species of trees. The resin has no connexion with this coloring power.

The oil of pit coal contains a great quantity of cyanol, whose presence is easily detected by mixing 1 part of oil with a solution of 20 water and 1 part muriate of lime. The oil becomes dark red and the solution assumes a blue color, similar in intensity and appearance to the moist ammonia sulphate of copper. It is changed by the muriate of lime into an acid which forms compounds possessing a blue color.

Cyanol is very readily detected by muriatic acid, when coal oil is mixed with the latter in the proportion of 3 volumes to 1. The acid becomes brown; and a splinter of fir wood introduced into the solution, has the yellow color already described communicated to it, thereby indicating the presence of cyanol.

2. *Pyrrol.* Pyrrol (red oil) in a pure state is a gaseous body possessing the odour of turnips, (*markochen ruben*) and may be detected by dipping a stick of fir moistened with muriatic acid in a vessel containing pyrrol, when it is tinged purple red, and which like the effect of cyanol is not removed by chlorine. Paper, &c., treated in the same manner remains colorless. The coloring power of the compounds of pyrrol is not less strong than that of cyanol. Nitric acid produces in the aqueous solution of pyrrol a red color.

It is difficult to detect pyrrol in coal oil, as the cyanol and carbolic acid render its re-action indistinct, but it may easily be discovered in water which has been employed to wash common street gas, by saturating it with muriatic acid, and dipping into it a stick of fir. A purple red color is occasioned.

Pyrrol forms the principal constituent of empyreumatic ammonia, and when its peculiar smell is known, it may be distinguished among the odours which are disengaged by the distillation of bones and horns. Pyrrol is also contained in tobacco oil.

3. *Leucol.* Leucol (white oil) has been so termed because its re-action is colorless. It does not produce a blue color in muriate of lime, nor does it communicate to fir any tinge. Leucol is an oily substance, and is well characterized by the salts which it forms with acids, it loses its smell by its combination with acids and forms with oxalic acid crystallized salt.

When brought in contract with the moist skin, acetate of Leucol emits a smell like phosphorus.

ACIDS.

1. *Carbolic Acid.* This acid is a colorless oily substance, sinking in water. Its smell is extremely empyreumatic; it is caustic and burning, and has a strong action on the skin. When the skin is rubbed with it, a feeling of burning is felt, and a white spot is produced, which on being touched with water becomes red, and in some days desquamates. In this respect it corresponds with creosote, but differs in being acid; in being precipitated by acetate of lead, and in not being altered by ammonia or the atmosphere, and in being converted by nitric acid, even diluted, into a reddish brown matter.

Carbolic acid dissolves in water. The solution is colorless and the acid is easily rendered conspicuous with nitric acid. The water is at first yellow or orange, and afterwards reddish brown; a stick of fir plunged in dilute carbolic acid takes, after being moistened with muriatic acid, in half an hour a blue color. The vapour of muriatic acid also tinges shavings moistened with carbolic acid of a blue color. This tinge withstands the action of chlorine in a high degree.

The salts of carbolic acid are colorless and many of them can be crystalized: their aqueous solutions present the same appearances with fir as the solution of cabolic acid. Carbolic acid precipitates albumen, prevents organic substances from putrifying, and removes the putrid smell of meat, when digested with an aqueous solution, much better than chlorine. The presence of carbolic acid may be detected in coal oil by mixing it with lime water, filtering and evaporating to the consistence of a syrup. Muriatic acid separates impure carbolic acid from this mass, which is impure carbolate of lime.

2. *Rosolic Acid.* This acid (rose oil) is a product of the chemical decomposition of coal oil, and contains what is remarkable, a true pigment. It produces red and lake colours which are equal in beauty to saffron, cochineal and madder.

Rosolic acid is a resinous mass which may be reduced to powder, and assumes an orange yellow color.

The principal from which rosalic acid is formed has not yet been detected; but its presence may be easily demonstrated by mixing lime water with coal oil, filtering the watery solution, and allowing it to stand for some hours. The colorless or yellow solution now becomes red: which is occasioned by the precipitation of the rosolate of lime.

3. *Brunolic Acid.* Brunolic acid is formed in the same way as the rosolic. It is vitreous, shining, easily pulverized, and resembles asphaltum. Most of the compounds of brunolic acid are brown and insoluble, whilst those of rosolic acid are red and soluble.

Besides these six substances, there is still another which has not been obtained in a separate state.

Separatson of Cyanol and Leucol.—Mix together and agitate 12 parts of coal oil, 2 of lime and 50 of water. After 6 or 8 hours pass the liquid through a filter. It is of a brownish yellow color and should be distilled one half. The liquid which comes over consists of a thick oil, and a solution of it in water contains carbolic acid in combination with ammonia, leucol, pyrrol, and cyanol. Five distillations are required to separate the cyanol and leucol from this mixture. The first distillation is conducted with an excess of muriatic acid, by which means the pyrrol and carbolic acid pass over into the receiver, and the process is continued till the liquid passing over is no longer red, brown, or yellow, when it is to be mixed with nitric acid. The retort now contains a mixture of ammonia, leucol, and cyanol in union with nitric acid. This mixture possesses a bright yellow color, and should now be distilled with an excess of caustic soda. The three bases pass over into the receiver with the water, and in the retort remains the yellow ley with nitric acid. The matter is to be re-distilled with an excess of acetic acid, and the process is to be continued till the liquid passing over tinges fir wood. Acetate of cyanol and leucol collect in the form of a colorless solution in the receiver, while a great portion of the ammonia remains in combination with acetic acid forming a residum. The acetic acid salts are now to be converted into oxalates by distillation with oxalic acid

When the liquid which passes over tinges wood yellow, it is a proof that the bases are saturated. The liquid in the receiver is now to be gently evaporated by dryness. The mass consisting of oxalates of cyanol and leucol mixed with a little coloring matter and ammonia, should be reduced to powder digested with spirits, and thrown on a filter, the spirits and coloring matter pass through the filter and leave the salts. This digestion and filtration should be repeated till the liquid passing through is colorless. The funnel should then be transferred to another vessel, and spirits digested on the salts as long as any are dissolved. Oxalate of ammonia now remains upon the filter, and the spirits contain in solution exalates of cyanol and leucol, which by the evaporation of the spirits are obtained in crystals. These are to be dissolved in water and laid aside to crystalize. Fine needle crystals of oxalate of leucol first appear, and after some time crystals also of oxalate of cyanol make their appearance. The latter are in broad plates of a brownish color, and change with muriate of lime to a violet blue, and turn wood to a yellow color. Should the two salts after separation not be quite pure, they should be repeatedly dissolved in alcohol and crystallized. To separate the two bases from the salts, it is only necessary to distil them with soda ley, when they pass over into the receiver with the vapour of the water.

Separation of Pyrrol.—It is extremely difficult to obtain pyrrol in a separate state, in consequence of its affinity for carbolic acid. To obviate the effects of the acid, it is best to saturate the empyreumatic ammonia which passes over from the distilled bones with an acid The matter which passes into the receiver should be mixed in the first Woulf's bottle, after being filtered, and the discharged gases absorbed by caustic potash, or lime water. By distillation, the pyrrol is carried into the receiver, forming a colorless solution, which produces a purple red in wood. To purify the pyrrol, it should be distilled with muriatic acid, when muriate of pyrrol passes over. When distilled with caustic ley the pyrrol comes over pure.

Separation of Carbolic Acid.—Agitate together 12 parts of coal oil 2 of lime, and 5 of water, at intervals, for six or eight hours. The filtered liquid should be boiled down to a fourth part, filtered after cooling, and mixed with an excess of muriatic acid. Impure carbolic acid collects at the bottom of the vessel, in the form of a brownish oil. The supernatent liquid should be removed, the brown oil washed with water, and subjected to distillation. A milky liquid passes over, from which some colorless oily drops separate, which are pure carbolic acid. As much water is now to be added to the receiver as will dissolve the oil, and then the liquid precipitated with acetate of lead. Carbolate of lead is formed, which, after being well washed, is subjected to dry distillation. The carbolic acid collects in the receiver in the form of a yellow oil, which after rectification, appears as a thick liquid, consisting of pure anhydrous carbolic acid. When the lead salt is not properly dried, water passes over with the acid.

This process is necessary to free it from the heterogenous compounds in the coal-tar, which are ammonia, cyanol, pyrrol, and leucol. These are removed by the boiling. Creosote and sulphur are partly precipitated by the lead, and the rosolic and brunolic acids remain in the retort, while the water is separated by rectification.

Separation of Rosolic and Brunolic Acid—The residue in the retort, after the last process, is to be boiled with water, dissolved in spirits, and mixed with lime water. A rose colored solution of rosolate of lime is formed, and brunolate of lime remains at the bottom, as a brown precipitate. From the rosolate of lime the rosolic acid is separated by acetic acid, and again combined with lime, whereby brunolic acid separates. The decomposition, by means of acid and repeated solution, should be continued as long as brunolic acid is observed. The rosolic acid is then collected on a filter, and dissolved after edulcoration and drying in alcohol. There remains on evaporation, a vitreous, hard, orange colored mass The rosolic acid may also be separated by evaporating the solution of rosolate of lime to the thickness of syrup, and mixing it with one third spirits. In the course of a day red crystals of the salt appear on the sides of the glass, which are to be removed, well washed, dissolved in water, evaporated, and treated with acetic acid and lime water. The brunolic acid is separated from the brunolate of lime by digestion with an excess of muriatic acid. The brunolic acid separates in brown flakes, which for complete separation from the rosolic acid, must be repeatedly treated with lime and acid. The acids separated from the lime by muriatic acid, are dissolved in soda ley, and the solution is mixed again with muriatic acid, when a pure precipitate of brunolic acid falls, which may be completely purified by solution in alcohol.

Apprentices —The Mechanic Arts.—If we should desire to counteract the pernicious influence of Trades Unions and radicals from abroad, we must teach our sons the Mechanic Arts and bind more of them as apprentices to substantial and profitable employments than we are now in the habit of doing. We are all wrong in underrating the value of mechanical occupations—we are all wrong in making all our sons Doctors Lawyers, Divines and Merchants. Some branches of the family should be mechanics, and if when they are out of their time, we can give them some money to commence business, with we at once set them on the road to independence—to solid independence, weight and influence. Employment, labor, healthy, refreshing, constant labor, is the grand secret to keep boys correct and moral, to keep them out of vice in every shape to make good sons and good citizens of them. There are many poor widows with boys from ten to thirteen years of age, who are not probably aware that if they are good and industrious can earn from one hundred to one hundred and fifty dollars per annum, and have steady employment. This is much more profitable in every respect, than running about the streets after soldiers or fire engines.

We have often wondered that so few sons of gentlemen of fortune, offer as apprentices to some mechanical pursuit to the Printing business—a business which is light and agreeable, and combines so many advantages. It may be asked what are the benefits of this branch of the Mechanical Arts. The sons of persons in easy circumstances who can board and lodge them without cost until they are out of their times—who will superintend their comforts and morals and feel, as they ought to feel, an interest in their advancement may realize the following advantages.

1st. They learn a business which ranks high in the cultivation of the human mind; a business by which they at once become familiar with the moral and political condition of the country—the advancement of the mechanic arts—the progress of internal improvements—a business which made Dr. Franklin the great man he is, by the whole world allowed to have been.

2d. The Printing business includes a knowledge of proof reading, some acquaintance with the art of paper making—and in newspaper office where a boy is intelligent, quick, ambitious to excell, he becomes familiar with editorial pursuits—and when out of his time, becomes proprietor, or part proprietor of a city or country paper, and if prudent, temperate and industrious, may become a conspicuous politician, and fill any of the high offices of the country, as we see at present in beholding Printers, Senators in Congress and members of the House of Representatives. So much for our profession, but there are many noble mechanical pursuits which should be cultivated by young men of good family and education.

The Builder, which includes the beautiful science of architecture, the ship builder; a first rate and respectable calling. Workers in gold, silver, copper and other metals. Cabinet Making In short, we could name fifty occupations—more valuable—more enduring—more healthy; more positively independent, than the range of professional callings, and the sickly, poverty stricken labor of the midnight lamp.

By this course we shall bring into the line of mechanics an intelligent, well educated, highly respectable class of American citizens, free from radicalism, combinations, unjust extortions or disreputable associations.—[New-York Evening Star]

Dr. Arnott's New Stoves.—At a meeting of the Philosophical Society of Edinburgh, which took place lately, one of Dr. Arnott's new stoves was exhibited. It is an oblong box, about three feet long, two broad, and two deep, carefully made air tight on every side A partition within divides it into two parts, apertures above and below enabling them to communicate with each other. An apperture is arranged for the free admission of air, and another for carrying off the smoke; an air-tight door admits fuel. A stove made of earthenware, and placed on one side of the partition, contains all the fuel required, and the hot air circulates round and round the partition before it is eventually carried off by the small tubular chimney. An extensive surface of 32 square feet is thus presented to the air at a moderate elevation of temperature, about 212; and accordingly, scarcely any thing passes up the chimney which has not been almost entirely exhausted of its heat. This stove saves equally time, trouble and fuel, and is quite free from the dust of a common fire.

During the present recess several valuable additions have been made to the British Museum; among others a very splendidly engraved sarcophagus of green basalt, presented by the Duke of Hamilton, who was present on its arrival at the Museum on Monday. Shortly after the opening in October next, two new rooms, situated over the gallery of Antiquities, will be opened, in which are deposited many curious and interesting relics from Upper and Lower Egypt. An immense tank for water has been sunk in the court yard, with a very powerful engine in case of fire. [Chronicle.]

We cannot forbear copying the following sound remarks, from the Philadelphia Commercial Herald. Quackery is so common now a days, and in other branches of science than that of medicine. And that a very slight change of them will render the application universal.

A WORD FOR THE FACULTY.

We have already mentioned the mighty discovery of vaccination, as one signal instance of the benefit conferred upon mankind by the scientific researches of regular physicians. We could fill a volume in mentioning others. The wonderful discoveries in chemistry within the last fifty years, nearly all of which have been made by members of the faculty, and by which the practice of medicine has undergone many important changes, afford another mighty proof of the value of these scientific researches so much contemned be the ignorant. Not one of these discoveries could have been made by a quack; and for the simple reason that a quack never generalizes, or reason by induction. His practice consists merely in the application of supposed specifics. He makes a certain application in any one disease, because he supposes or leads the patient to suppose that the thing applied possesses some secret virtue, some mysterious power over the disease in question. But if sincere in this belief, he knows not in what this power consists; for not understanding the principles on which the human system is constructed and acts, or the construction and action of his remedy, he knows not how one can reach or effect the other. Hence he can draw no conclusion from one case to apply to another. He has no THEORY, no set of general ideas or principles upon any disease. His whole practice consists of a collection of detached unconnected facts, of partial experiences, from no general conclusion can be drawn, and which consequenly furnish no guides in new cases. For instance; a well informed physician would administer bark or other powerful stimulant in an intermittent fever; but only in a particular stage of it. The time chosen would be before the access of its cold stage; because according to his philosophical reasoning upon general principles, the cold stage arises from deficiency of action, and the hot stage is a consequence of it, or a return of the tide after its ebb. Hence if the action of the system can be roused before the cold stage, that stage will be prevented, and its consequence also. The quack, ignorant of the principle that action and reaction are equal in physiology as well as mechanics, that excessive action is always followed by proportionate relaxation, and in many cases that undue relaxation is succeeded by undue action will imitate the regular physician in prescribing bark in an intermittent form, but without regard to the time of application That bark is good in fevers is all he knows His general knowledge is not sufficient to tell him how or when it is good, and he may therefore give it at the wrong period, He may administer it during the hot stage, and thus aid the disease in exhausting the energies of the system. He may give it during the healthy interval, immediately after the hot stage has subsided and thus produce an undue excitement, to be followed by a proportionate relaxation at the very access of the cold stage. In either case, the system is reduced at the period of the cold stage, when excitemen is most needed, and thus the disease is aggravated.

This single instance is sufficient to illustrate the difference between the learned physician and the quack. The first collects facts, then classifies and composes them, thence attains a knowledge of general principles, and by reasoning upon these principles, draws correct conclusions concerning new facts. The second collects facts, but does not classify or arrange them, or deduce from them general principles. His facts are deposited in the store house of his memory without arrangement, no one is connected with any other by any bond of union, each is distinct and independent, and if made the basis of a conclusion concerning a new fact almost inevitably misleads. The one draws his conclusions from a principle, the other from a solitary fact. A principle is proved by a multitude of facts, but a solitary fact proves nothing beyond its own existence. The difference between the two is the same that is exhibited between the man and the monkey in regard to a fire. The man maintains the fire by adding fuel, because he knows that fire consumes wood and produces heat by the process, and he thence infers that so long as he can supply fuel he can have the means of warming himself. The monkey knows from experience that a fire produces warmth, and will therefore approach it to keep warm; but his sagacity reaches not to the conclusion that fuel is necessary to maintain the fire.

WOODEN PAVEMENTS.—An intelligent correspondent of the Bulletin, in his argument in favor of wooden pavements, adduces the following facts:

In 1807 Mr. Pierre Percy, of the faubourg Saulet, was called upon by Mr. Lafon, city surveyor, to assist in running the line between the suburbs Saulet and Annunciation, which they were enabled to do by tracing the old plantation fence, made of cypress pickets, the buts of which under ground were free from decay, although they must have been there for about 40 years. Mr. Percy further states, that most of the pickets have been dug up in cultivating a garden, or he could have still traced the fence, although it must now be seventy years at least since it was erected.

Mr. Pilie city surveyor, can produce a still more striking instance of the durability of cypress when covered with earth.

On the 19th July, 1819, on digging the ground in or near Canal street, he discovered the butts of the palisades of the old French fortification, which he believes were at the time upwards of one hundred years old! The ends of the pickets were in a sound state; and he believes that even at the present day he could trace the whole alignment of the palisades.

I regret not having the History of Louisiana to refer to for the probable date of his fortification: but as it was prior to the occupation of the country by the Spaniards, I presume that the *durability* of cypress will no longer be contested.

Should any fears be entertained that the increased demand for cypress would too much enhance the price, it is proper to state that mulberry timber is equally durable, and can be procured in any quantity on the Ouachita river, from whence it can be brought down in rafts.

In 1815 the posts of an old saw mill at the mouth of Bayou Moreau, in the parish of Point Coupee, were perfectly sound, though Mr. Poydras believed the mill to have been built 40 or 50 years. If they have not been subsequently cut down, it is probable they may exist at the present day in an undecayed state.

At Bristol it is anticipated that the advantages of the railway from that place to London will be immense to the agricultural interest. The *minimum* velocity is to be 40 miles an hour, and therefore, at the *slowest* rate of travelling, cattle landed at this quay at five in the morning may be at Smithfield market when the clock striked eight.—[Chronicle.]

The attention of Contractors is called to the following notice. The district of country is one highly favorable as we believe to works of this nature.

Early application should be made as it will be perceived that the time expires on the 20th of December.

TO CONTRACTORS.

ENGINEER DEPARTMENT, BALTIMORE AND SUSQUEHANNA R. R. COMPANY, Baltimore, Nov. 22d, 1836.—Proposals will be received at this office until the 20th December next, for laying the Rails on 56 miles of road from Baltimore to York, and twelve miles of the Wrightsville and York Railroad.

The work to be commenced on the 1st of April next. Notice is thus early given to enable the Contractors to make the necessary arrangements.

For further information apply at this office during the week previous to the 20th December.

ISAAC TRIMBLE, Civil Engineer.

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HARVEY'S PATENT RAILROAD SPIKES.

THE Subscribers are manufacturing and are now prepared to make contracts for the supply of the above article. Samples may be seen and obtained at Messrs. BOORMAN, JOHNSON, AYRES & Co. No. 119 Greenwich Street, New-York, or at the Makers in Poughkeepsie, who refer to the subjoined certificates in relation to the article.

HARVEY KNIGHT.

POUGHKEEPSIE, October 25th, 1836.

The undersigned having attentively examined HARVEY'S PATENT FLANCHED and GROOVED SPIKES is of the opinion, that they are decidedly preferable for Rail oads to any other Spikes with which he is acquainted; and shall unhesitatingly recommend their adoption by the different Railroad Companies whose works he has in charge.

BENJ. WRIGHT,
Chief Engineer N. Y. & E. R. R.

NEW-YORK, April 4th, 1836.

Harvey's Flanched and Grooved Spikes are evidently superior for Railroads to those in common use, and I shall recommend their adoption on the roads under my charge if their increased cost over the latter is not greater than some twenty per cent.

JNO. M. FESSENDON, Engineer.

BOSTON, April 26th, 1836. NO. 44—7t.

THE NEW-JERSEY, HUDSON AND DELAWARE RAILROAD.

NOTICE is hereby given that under and by virtue of an act of the Legislature of the State of New-Jersey, entitled, "A further supplement to an act to incorporate the New-Jersey, Hudson and Delaware Railroad Company, passed the 8th day of March A. D., eighteen hundred and thirty-two," the books to receive subscriptions to the Capital Stock of said Company will be open at 10 o'clock, A. M., of each of the days following, viz:

On Tuesday, the 8th Nov. next, at Joseph Tilman's, Columbia, N. J.

Wednesday and Thursday, 9th and 10th Nov. next, at John J. Blair's, Gravelhill, N. J.

Friday, 11th Nov., at George Crockett's Marksboro, N. J.

Saturday, 12th Nov., at Peter B. Shafer's, Stillwater, N. J.

Monday, 14th Nov., at John S. Warbasse's, Newton, N. J.

Tuesday and Wednesday, 15th and 16th Nov., Abm. Braw's, Augusta, N. J.

Thursday, 17th Nov., at Stephen Ward's, Hamburg, N. J.

Friday and Saturday, 18th and 19th Nov., at H. Vibbert's, Dechertown, N. J.

Tuesday and Wednesday, 13th and 14th Dec., at United States Hotel, Newburgh, New-York.

Thursday, 15th Dec., at No. 34 Wall-street, city of New-York.

Also continue open at the last mentioned place until the whole stock shall have been subscribed for, or at the discretion of the Commissioners. But if the whole of the Stock shall be subscribed for at either of the above mentioned places, the books will be immediately closed.

The Capital Stock is $500,000 with liberty to increase to $800,000, divided into shares of $100 each.

The sum of $5 on each share is required to be paid on subscribing.

SAMUEL FOWLER,
JOHN BELL,
JOSEPH CHANDLER,
WILLIAM HYBERGER,
ENOS GOBLE,
DANIEL HAINES,
SAMUEL PRICE,
JOHN I BLAIR,
JOSEPH E. EDSALL,
COMMISSIONERS

Dated Oct. 3rd, 1836 41—9t

PATENT RAILROAD, SHIP AND BOAT SPIKES.

☞ The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.

Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes. (1)23am) H. BURDEN.

NEW ARRANGEMENT.

ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers having formed a co-partnership under the style and firm of Durfee, Coleman & Co., for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without splice, at short notice, the manufacturing of cordage, heretofore carried on by S. S Durfee & Co., will be done by the new firm. All orders will be promptly attended to, and ropes will be shipped to any port in the United States.

8th month, 8th, 1836. Hudson, Columbia County State of New-York.

E. S. TOWNSEND, GEORGE COLEMAN,
ROBT. C. FOLGER, SYDNEY S. DURFEE
39—tf.

FRAME BRIDGES.

THE subscriber would respectfully inform the public, and particularly Railroad and Bridge Corporations that he will build Frame Bridges, or vend the right to others to build, on Col. Long's Patent, throughout the United States, with few exceptions. The following sub-Agents have been engaged by the undersigned who will also attend to this business, viz.

Horace Childs,	Henniker, N. H.
Alexander McArthur,	Mount Morris, N. Y.
John Mahan,	do do
Thomas H. Cushing,	Dover, N. H.
Ira Blake,	Wakefield, N. H.
Amos Whitemore, Esq.,	Hancock, N. H.
Samuel Herrick,	Springfield, Vermont.
Simeon Herrick,	do do
Capt. Isaac Damon,	Northampton, Mass.
Lyman Kingsly,	do do
Elijah Halbert,	Waterloo, N. Y.
Joseph Hebard,	Dunkirk, N. Y.
Col. Sherman Peck,	Hudson, Ohio.
Andrew E. Turnbull,	Lower Sandusky, Ohio.
William J. Turnbull,	do do
Sabried Dodge, Esq.,	(Civil Engineer,) Ohio.
Booz M. Atherton, Esq.	New-Philadelphia, Ohio.
Stephen Daniels,	Marietta, Ohio
John Rodgers,	Louisville, Kentucky.
John Tillson,	St. Francisville, Lous'a.
Capt John Bottom,	Tonawanda, Penn
Nehemiah Osborn,	Rochester, N. Y.

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington, two miles from the former place. Across the Metawamkeag river on the Military road, in Maine. On the National road in Illinois, at sundry points. On the Baltimore and Susquehanna Railroad at three points. On the Hudson and Paterson Railroad, in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contocook river at Hancock, N H. Across the Connecticut river at Haverhill, N. H. Across the Contocook river, at Henniker, N. H. Across the Souhegan river, at Milford, N. H Across the Kennebec river, at Waterville, in the state of Maine.—Across the Genesse river, at Mount Morris, New-York, and several other bridges are now in progress.

The undersigned has removed to Rochester, Monroe county, New-York, where he will promptly attend to orders in this line of business to any practicableextent in the United States, Maryland excepted.

MOSES LONG.
General Agent of Col. S. H Long.

Rochester, May 22d, 1836. 19y-tf.

ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order, IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

WESTERN RAILROAD.

PROPOSALS will be received at the Office of the Western Railroad Corporation, in Worcester, untilthe 20th November, for the grading and masonry of the first division of the Road, extending from Worcester to East Brookfield, a distance of 19¾ miles.

Plans, profiles, etc., will be ready for examination after the 10th November. W. H. SWIFT,
Resident Engineer.

Worcester, Mass. Oct. 19, 1836 43—tnov20

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads.

No. 264 Elizabeth street, near Bleecker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation J25tf

AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens	Ames' superior back-strap	Shovels
150 do	do do plain	do
150 do	do do cast steel	Shovels & Spades
150 do	do Gold-mining	Shovels
100 do	do plated	Spades
50 do	do socket	Shovels and Spades.

Together with Pick Axes, Churn Drills and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York
BACKUS, AMES & CO.
No. 8 State street, Albany

N. B—Also furnished to order, Shapes of every description, made from Salsbury refined Iron. 4—yf

RAILWAY IRON, LOCOMOTIVES, &c

THE subscribers offer the following articles for sale.

Railway Iron, flat bars, with countersunk holes and mitred joints,

						lbs.	
350 tons	2½	by	½,	15 ft in length, weighing	4 $\frac{68}{100}$	per ft.
280 "	2	"	½,	" " "	3 $\frac{50}{100}$	"
70 "	1¾	"	½,	" " "	2¼	"
80 "	1½	"	½,	" " "	1 $\frac{25}{100}$	"
90 "	1	"	½,	" " "	½	"

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz. 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2¼, 2¾ 3, 3¼, 3½, 3¾, and 3¾ inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand flax.

Also Patent Hemp Cordage for Inclined Planes, and Canal Towing Lines.

Patent Felt for placing between the iron chair and ston block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

Mr. Solomon W. Roberts, a highly respectable American Engineer, resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron &c. ordered through us

A. & G. RALSTON.
28-tf Philadelphia, No. 4, South Front st.

RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

Also, CAR SPRINGS
Also, Flange Tires, turned complete
18 ROGERS, KETCHUM & GROSVENOR

TO RAILROAD CONTRACTORS.

PROPOSALS will be received until the 8th day of December next, for the graduation and masonry of the first ten miles of the Gainsville and Narkeeta Railroad. A profile of the route, with plans and specifications of the work, will be exhibited at Gainsville, for ten days previous to the time of letting and all other information given, on application to the subscriber or to the Assistant Engineer. Recommendations will be expected in all cases, of persons not known to the officers of the company or to the Engineer

For the information of persons at a distance, it may be remarked, that this road commences at the town of Gainsville, on the Tombeckby river, and extends twenty-two miles south-west to Narkeeta in the State of Mississippi. The Tombeckby is navigable for Steamboats the greater portion of the year and having a direct communication with Mobile and New-Orleans, will afford facilities for procuring the supplies necessary for the hands employed on the work, or for their ready conveyance hither, if procured from a distance. The country through which the road is located, being perfectly healthy, and the mildness of the climate admitting of operations throughout the winter season renders the contract peculiarly desirable to those wanting winter employment. To an enterprizing and energetic contractor the construction of this road offers the prospect of a profitable job.

D. H. BINGHAM, C. E.
Gainsville, Ala. Sept. 21, 1836. 42—tDec1

ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)
NEW-YORK, February 12th, 1836.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

H. R. DUNHAM & CO.
4—yf